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February 7, 1938

STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

HOLDEN
NEUTRAL BATHS

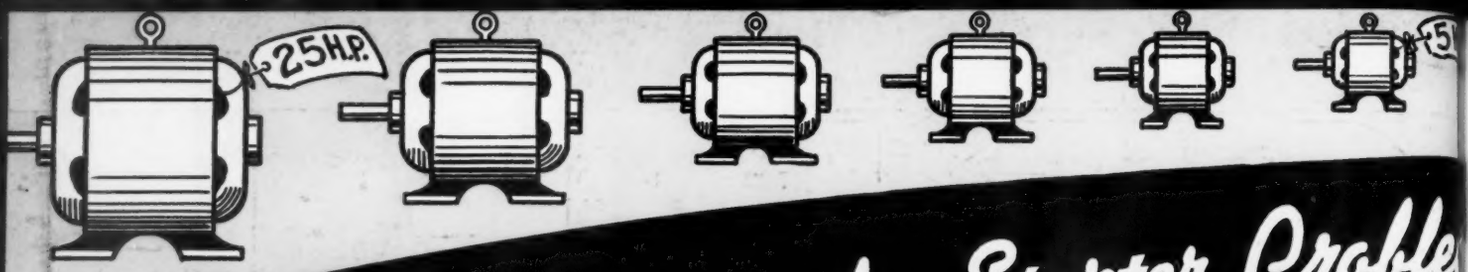
neither
carburize
nor
decarburize

A neutral bath that neither raises nor lowers the carbon content of your "premium stock"... a HOLDEN development containing no cyanide and therefore ideal for the hardening of springs, drawing of high speed steel, annealing of wire, heat treatment of alloy steels, certain types of dies, etc., where either carburization or decarburization proves fatal to the work.

Recent laboratory tests of the HOLDEN NEUTRAL BATH No. 8-15 made in one of the largest automobile plants on six distinct grades of alloy steel positively showed little, if any change in their carbon content. Actual figures of the test are available to those interested.

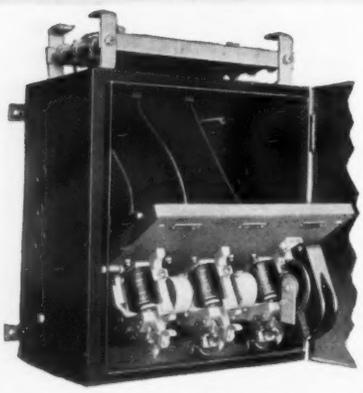
If your production involves a heat treating bath of either standard or special analyses, HOLDEN Engineers can effect a considerable savings in both time and costs.

A. F. HOLDEN COMPANY
NEW HAVEN, CONNECTICUT

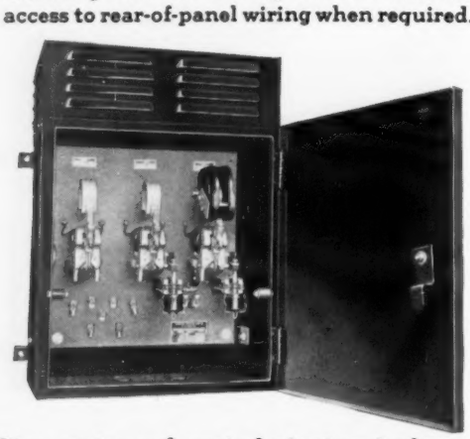


EC&M Simplifies the Starter Proble

Only ONE Starter for many Horsepower size



Starter-panel can be easily tilted forward for access to rear-of-panel wiring when required.



Line, motor and control wire terminals are on the front of the panel. Ventilated enclosure protects resistors.

Similar Starters Built for Motors 26-35 H.P.

THE ELECTRIC CONTROLLER & MFG. CO. CLEVELAND, OHIO

HEAVY DUTY MOTOR CONTROL FOR CRANES, MILL DRIVES AND MACHINERY • BRAKES • LIMIT STOPS • LIFTING MAGNETS AND AUTOMATIC WELD TIMERS.

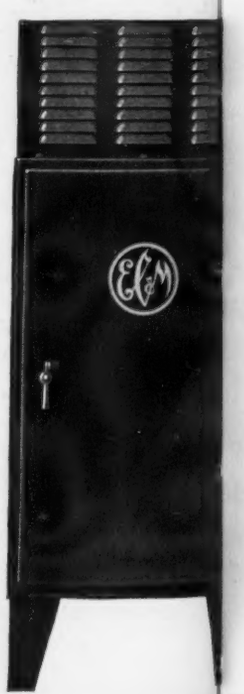
This Standardized Unit for 5-25 H.P. moto proves valuable ally to D-C motor use

NOW only one starter of mill duty construction required for many ho power sizes—reduces spare part problem—makes it possible for us having many motors in this range to stock only one unit as a spare for placement or emergency addition.

It is a matter of only a few minutes after taking one of these EC Bulletin 1083 Type RD Starters from the store-room to adapt it from horsepower rating to another. Each unit is provided with ample resista and a sufficient number of taps to permit quickly connecting the resistors to give the proper value of starting torque for the motor with which the starter is to be used. And acceleration time which is provided by definite time relays can be easily lengthened or shortened as needed by simply turning thumb screws conveniently located on the front of the starter-panel.

These starters are built in four sizes. The two smaller sizes for motors from 5 to 25 HP and from 26 to 35 HP are arranged for wall mounting and with provision to tilt the panel forward as shown. The two larger sizes are arranged for floor mounting and have resistors designed for the motor with which they will be used.

Main line contactors are the new EC&M *LINE-ARC* Contactors which, by scientific control of the arc, materially lengthen contact life and eliminate destructive burning on the arc shields. Investigate these heavy duty, direct current motor starters today. Write now for a copy of Bulletin 1083 giving complete information.



Larger Starters Arr For Floor Mounti

NEW ACCURACY

Comments

Readers are invited to comment upon articles, editorials, reports, prices or other editorial material appearing in STEEL. The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief—preferably not exceeding 250 words.

New Price Set-up Pleases

EDITORS' NOTE — Following the change in the method of presenting quotations on warehouse products in STEEL readers sent in many favorable comments, some of which are reproduced below:

To the Editor:

You are to be complimented on the very fine way the warehouse prices have been arranged and I know a great many of the purchasing agents will appreciate it.

C. R. HESLER
Tri-City Steel & Supply Co.,
Moline, Ill.

We believe all warehouses will appreciate your efforts to give us more details regarding warehouse prices. Naturally we are interested and wish to thank you for your efforts.

BENJ. R. DWYER
Vice President,
L. L. Ensworth & Son Inc.,
Hartford, Conn.

We note your new table of warehouse steel prices and wish to advise that we like it, as it is simple, clear and concise.

R. L. STOFER
Manager of Sales,
Paterson-Leitch Co.,
Cleveland.

We have looked over the new set-up of the table of warehouse steel prices and believe it is quite an improvement over the old method. We believe grouping the cities in certain territories is better than the lineup formerly used and that your readers will appreciate this change.

We also wish to compliment you on the Yearbook of Industry issue.

THOMAS J. QUINN
Vice President,
W. F. Potts, Son & Co. Inc.,
Philadelphia.

Your new table of warehouse prices is a much better way of showing base prices. You have done a good job.

W. C. THOMPSON
Hamilton Steel Co.,
Cleveland.

Roads and Steel Linked

To the Editor:

I want to thank you for the editorial in STEEL, Jan. 24, on, "Road building and steel industry closely knit." I want to take this opportunity also to thank you for the splendid co-operation you have afforded our association in making the 1938 road show and convention the most successful in its 35-year history.

ROBERT E. HARPER
Director of Publicity,
American Road Builders' Association, Washington.

Our reaction to the editorial in STEEL, Jan. 24 on the close relations of the road-building and steel industries is most favorable and we believe it is most timely and appropriate. In view of the established merit of this editorial we should like to distribute about 50 copies among our allied fabricators, who are vitally interested in the highway industry.

R. C. BEGGS
Advertising Manager,
Toncan Culvert Manufacturers' Association, Cleveland.

Can't Get Ickes' Slant

To the Editor:

Here in West Virginia we have an entirely different picture of some of America's 60 families than that recently painted by Mr. Ickes.

In a large center we might have to depend upon second-hand interpretations. But a small-town editor has personal knowledge.

And we do not lack for information. This section of West Virginia has become highly industrialized. Its operations are backed by the money of some whom Mr. Ickes does not like. We have personal acquaintance with many persons who work for these operations; not executives alone, but many workers. We know how these corporations operate, what they do for the welfare of their employes, the degree of fairness in their dealings with employes and those who deal with them otherwise.

We just can't get Mr. Ickes' viewpoint. The industry made possible by the money of some of the 60 families has brought progress to West Virginia. It has made it possible for us to build paved roads. It has made it possible for us to improve and broaden our system of education. How? Two ways: (1) Through taxes. (2) Through wages and the taxes wages pay.

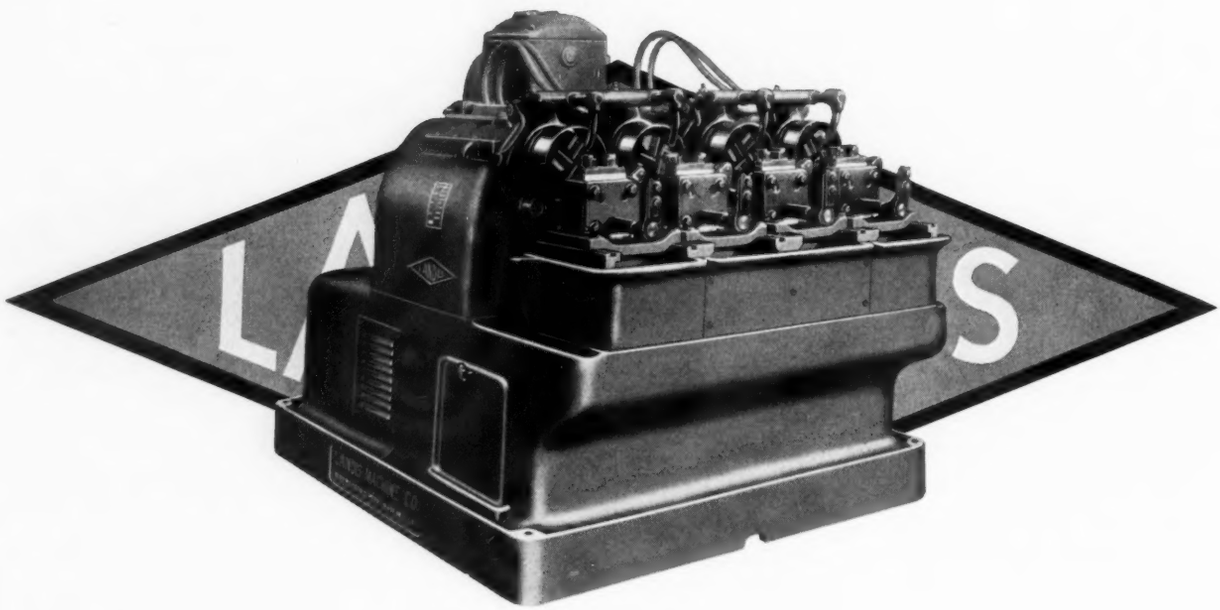
With industry also have come medical and social services which previously were not available to many of our people.

ROY H. JOHNSON
Editor,
Fayette Tribune,
Fayetteville, W. Va.

STOPS • LIFTING MAGNETS AND AUTOMATIC WELD TIMERS.

NEW ACCURACY ECONOMY SPEED

THE LANDIS 4 Spindle Semi-Automatic THREADING MACHINE



The Production Threading

of Automotive parts, studs, rods, etc., is simplified with this *new* addition to the LANDIS LINE.

The LANDIS 4 Spindle Semi-Automatic Threading Machine is a high speed machine of unusual flexibility. It is readily adaptable to the threading of rods, long bolts, cap screws, etc., and is likewise equally efficient for threading operations which require special work holding fixtures.

A few of the most outstanding features of the 4 Spindle Semi-Automatic Threading Machine are: gear controlled timing, patented thread starting mechanism, individual centering adjustment of the grip jaws, and positive safety devices which operate automatically to protect the operating parts of the machine in the event of an overload or an obstruction. The die heads may be quickly removed to permit the use of spare heads.

Production is no problem with the LANDIS 4 Spindle Semi-Automatic Threading Machine. Write today for Bulletin No. E-88 and complete details.

LANDIS MACHINE CO., Inc.
WAYNESBORO, PA.

STEEL

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

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PRODUCTION · PROCESSING · DISTRIBUTION · USE

FOUR 550 POUND CRATES ..handle SIXTY 500 POUND COILS

PICKLING CRATES WEIGH LESS AND LAST LONGER AS A RESULT OF ALL-WELDED MONEL CONSTRUCTION

Take a look at the four pickling crates below. Picture one of them loaded with steel strip—fifteen coils weighing a quarter of a ton apiece. No wonder smart pickling plant superintendents are turning more and more to *welded* Monel* construction for pickling equipment.

Clearly demonstrated by these particular crates are two important advantages that result from using Monel for *any* pickling crate:

1. Monel's toughness and strength combined with its stout resistance to corrosion make possible exceptionally light-weight construction. When you use Monel there's no need for a lot of extra weight, when new, to allow for later weakening.

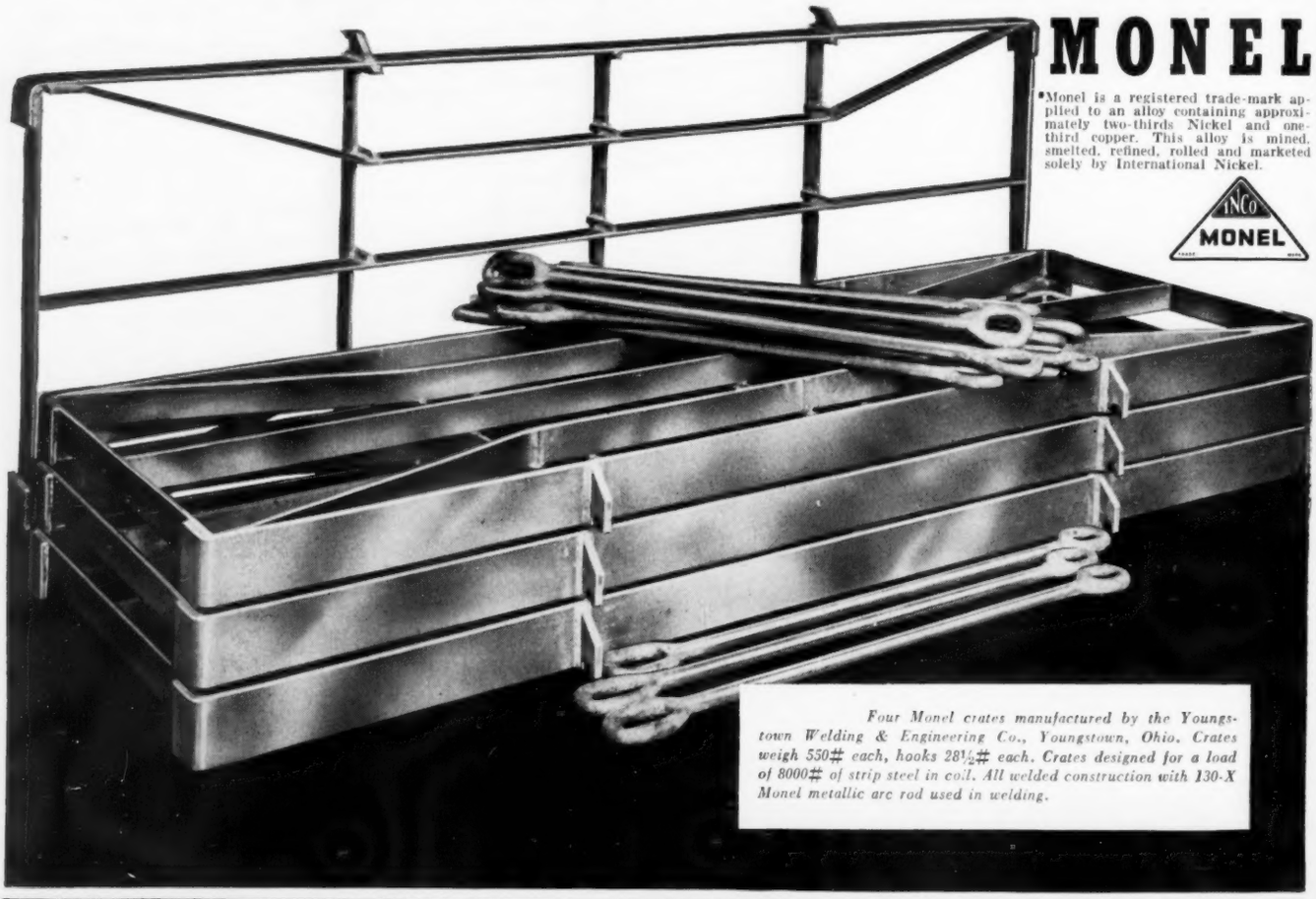
2. Monel's excellent welding properties make *even lighter* construction possible. And no danger of bolts, nuts or rivets loosening.

Use lightweight Monel crates and you save on power. You save also on repairs and maintenance, and get more years of economical service. Write for the booklet "Equipment Designs for the Pickle House".

MONEL

*Monel is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. This alloy is mined, smelted, refined, rolled and marketed solely by International Nickel.

INCO MONEL



Four Monel crates manufactured by the Youngstown Welding & Engineering Co., Youngstown, Ohio. Crates weigh 550# each, hooks 28½# each. Crates designed for a load of 8000# of strip steel in coil. All welded construction with 130-X Monel metallic arc rod used in welding.

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL ST., NEW YORK, N. Y.

STEEL
PRODUCTION • PROCESSING • DISTRIBUTION • USE

As the Editor Views the News

■ DESPITE the disorderly character of last week's conference, at Washington, of "little men" of business, expressions in general proved that there is very little divergence of viewpoint between "little" business and any other kind of business. Spokesmen told President Roosevelt that small business wants long-term, government-insured loans, repeal of the undistributed profits tax, modification of the capital gains tax, repeal of or sweeping amendments to the labor relations act, simplification of tax forms and assumption by labor unions of equal responsibility with employers for carrying out agreements. Above all, the President was requested for assurance of government co-operation with business and a cessation of attacks on business by administration spokesmen.

♦ ♦ ♦

Awaiting the Green Light

Disposition to proceed cautiously with industrial expansion is exemplified by a survey which shows that out of one group of 600 leading manufacturing companies 275 reported more than $155,000,000 of new work is being held up. On the other hand, STEEL's factual survey (p. 23) reveals that hundreds of millions of dollars are being expended for new and expanded plants, with millions more to be spent for tools and equipment. Expenditures for expanded capacity in the steel industry alone will aggregate at least $165,000,000 in 1938. Thus, many companies still recognize the logic of preparing for prosperity in times of depression. The survey indicates that a clarification of government policies would release hundreds of other improvement programs.

♦ ♦ ♦

Profit Line Changes?

What is the minimum rate of ingot production at which the steel industry can earn a profit? The answer to this question has changed surprisingly in recent years. During the fourth quarter of 1937 (p. 27) steel ingot production was at 40.63 per cent of capacity, the average of 58.31 for October, 38.22 for November and 25.36 for December. During that quarter the eight leading steel companies reported profits of $13,390,326. . . . Washing machine manufacturers now produce a tub in one forming operation and obtain a fine finish with one coat of enamel. From 1923 to 1929 two forming operations with an intermediate heat treatment and three or more coats of priming material and enamel were required. The improved sheets which permit such economies brought prices in 1937 which were 42 per cent below the 1923 and 26 per cent below the 1929 levels (p. 29).

♦ ♦ ♦

Tractors Travel Far

"Draw casting" is the term used in describing a new method for continuous casting of metal direct from the molten state (p. 50). The product is unusually dense; there is no apparent reason, it is said, why the new method should not be applied to casting ferrous as well as nonferrous shapes. . . . Accuracy in gear teeth is the real answer to quietness (p. 46) and correct inspection methods are the means of obtaining such accuracy. Highly developed inspection equipment is available for this purpose. . . . Many tractors have traveled, on their original tracks, a distance greater than the circumference of the earth. This performance results (p. 58) from careful control of fabrication and of heat treatment.

♦ ♦ ♦

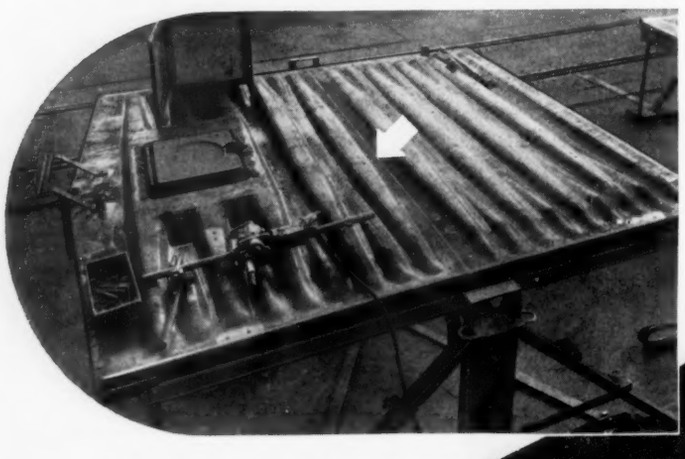
Economy by Salvage

As an example of savings which may be effected in well equipped steel mill welding departments, gas producer pokers are salvaged at one plant by a method involving replacement of worn ends (p. 62) with forged steel stubs hollowed out by an oxygen lance. . . . Of the spray type and constructed of ceramic tile, a new gas washer (p. 64) cleans 75,000 cubic feet of blast furnace gas per minute. The gas contains 6.75 grains of dust per cubic foot on entering the washer from the dustcatcher. On leaving, it contains 0.115 grains. . . . A new resistance welding method (p. 72) makes it possible to weld tubing without any external flash, thus eliminating grinding and sanding operations formerly required.

E. L. Shaner

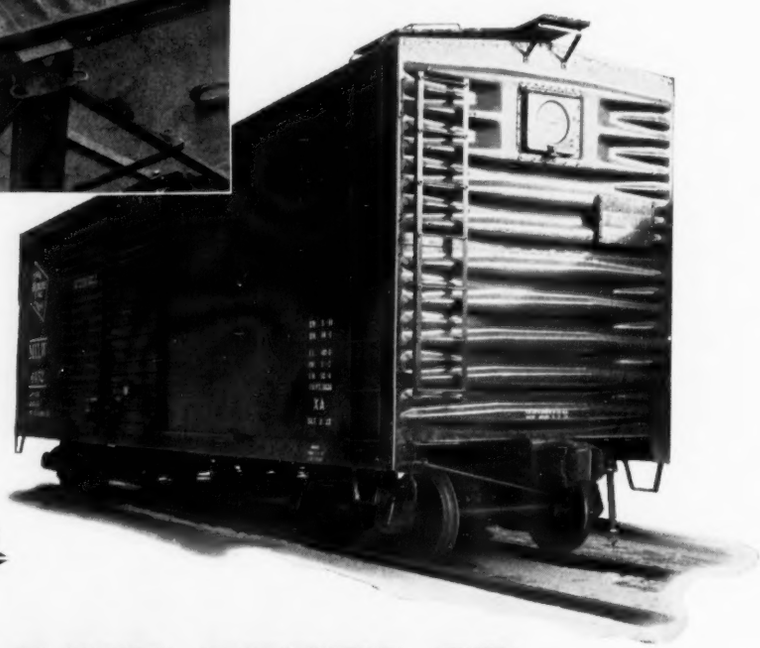
500 NEW AUTOMOBILE CARS SAVE TONS OF DEAD WEIGHT *with* INLAND HI-STEEL

Making 1,000 of these car ends of Hi-Steel involved no special or difficult fabrication problems.



Because Hi-Steel is high in ductility and remarkably uniform, many problems commonly met in building heavy equipment are avoided by the use of this material.

Hi-Steel welds excellently with either the electric or gas process. In fact, with gas it is a little more easily welded than carbon steel.



These 500 new cars recently built by the Chicago, Milwaukee, St. Paul and Pacific Railroad Company typify transportation's new bid for profits through cutting the waste load.

Car ends, sides and other parts built of Inland Hi-Steel provide the same structural strength with as little as half the weight that the use of ordinary structural steel would require.

Inland Hi-Steel also offers three other important advantages: (1) it is not a costly material; (2) it is more corrosion-resistant than standard copper bearing steel, and multiplies many times the life of carbon steel under average atmospheric conditions; and (3) it is easily worked. Heat-treatment is never required to retain or restore its normal properties.

Our Metallurgical Department will welcome the opportunity of giving you complete information on any use of Hi-Steel and of supplying practical samples for test purposes.

INLAND STEEL

INLAND STEEL CO.

38 SOUTH DEARBORN STREET, CHICAGO
DETROIT • KANSAS CITY • MILWAUKEE • ST. LOUIS • ST. PAUL

SHEETS STRIP TIN PLATE BARS PLATES FLOOR PLATES
STRUCTURALS PILING RAILS TRACK ACCESSORIES REINFORCING BARS

Undercurrent of Confidence Reflected in Many Expansion Plans Going Ahead

■ DESPITE the dismal tones of the recessional which echo through business, a distinct *andante* can be heard as far as plans for the future are concerned.

Hundreds of millions of dollars are being expended for new and expanded plants, a factual survey by STEEL'S editors reveals. Millions more are projected for tools and equipment.

Much of this program is a carry-over from projects started last year. Some such projects have been held up; a few canceled. A few more have been added since the turn of the year.

Awaiting the green light are many more millions for industrial expansion. Hundreds of projects, large, medium and small, pend clarification of governmental policy, modification of labor legislation, alleviation of burdensome taxes—the return of confidence.

Significant are the findings of a nation-wide survey by the H. K. Ferguson Co., Cleveland, industrial and construction engineers. Questioned were 2200 leading manufacturers; out of one group of 600 returns, 275 reported more than $155,000,000 of industrial expansion was being held up.

The reasons: Seventy-two per cent cited the undistributed profits tax; others blamed the government's policy toward industry and the Wagner labor relations act. None cited building costs.

Time-honored practice of far-sighted industrialists in making expansions in time of poor business in preparation for better demand in many instances has been deflected by new and artificial barriers.

Encouraging, however, is the fact that many large businesses are proceeding with improvement programs.

Notable is the steel industry which plans expenditure of at least $165,000,000 in 1938 for new equipment and construction, according to the American Iron and Steel insti-

♦

From Daisy Field to $60,000,000 Steel Plant in Year

■ These "before and now" pictures indicate the rapid progress on Carnegie-Illinois Steel Corp.'s $60,000,000 Irvin sheet-strip mill, near Clairton, Pa. Top shows the undeveloped terrain when ground was broken last May 22. Several million cubic yards of earth was handled in leveling the site and making excavations. Lower photo, a few days ago, shows the huge structures nearing completion. One cold reducing unit may be started in March; official opening is scheduled July 1.

tute. This is slightly more than half the $320,000,000 spent in 1937. The reduction reflects not only the low rate of current operations but also the fact many expansion programs were completed during 1937.

United States Steel Corp. will spend at least $80,000,000 in continuing its rehabilitation program and has borrowed $50,000,000 for that purpose.

From fabricating plants and consumers of iron and steel come other reports of expansion being carried forward. Many involve construction. Some companies are opening branch offices and warehouses. Some are increasing sales forces.

While it is obviously impossible to detail all those improvements the following gives a fair picture of what is transpiring and what is projected.

DETROIT

Norge division of Borg-Warner Corp., manufacturer of refrigerators, washing machines, gas and electric ranges and air conditioning equipment, plans expenditure of $2,000,000 for expansion of plants and personnel in Detroit and Muskegon Heights, Mich. Bulk of the expenditure will be concentrated in Detroit. Return to work of over 3000 is indicated. Program will be under way by late spring.

The new parts plants of Briggs Mfg. Co. at the city limits is nearing completion and production probably will be initiated by March 15. Briggs also has plans for a new engineering building on Conners avenue near its present plant on Mack avenue.

Equipment is now being installed in the new $1,000,000 plant of Firestone Steel Products Co. at Riverview, Mich., production of rims and air springs to start in 60 days.

The Ford expansion program may be completed by the end of this year, and there have been several additions to the original program, such as the new tool and die shop.

Work is still under way on the extensive expansion at Great Lakes Steel Corp., involving a new blast furnace, four new open hearths, and other incidental equipment. McLouth Steel Corp. is in process of installing the final pieces of equipment for its new cold-rolling mill, part of a $500,000 expansion.

The first unit of the new Burroughs Adding Machine Co. plant layout at Plymouth, Mich., has been completed. Ultimately it is understood this project will include ten plants, and the company will move from its present location on Second boulevard.

Divco Twin Truck Co. has let heating and plumbing contracts for its new plant in the northeast section of the city, involving expenditure of about $200,000 for the complete project.

Bower Roller Bearing Co. is spending about $30,000 for erecting a research laboratory. Philco Radio & Television Corp. also is concentrating research activities in Detroit, spending about $35,000 on improved facilities here to accommodate additions to its research and development staff.

Edison To Spend $18,000,000

Detroit Edison Co. will spend close to $18,000,000 on its plants here this year, bulk of this appropriation going for new turbogenerator equipment. Two large power plants, costing $3,500,000 each, will be completed late this year by Consumers Power Co., Saginaw, Mich., as part of a $16,000,000 expansion.

Wickes Bros. Co. at Saginaw, Mich., has completed plans for a new gray iron foundry. Michigan Steel & Bumper Co. at Grand Rapids, Mich., and the Saginaw Steering Gear division of General Motors also have plans out for small additions.

Tishken Products Co., builder of roll forming equipment, has plans for a small expansion of its Detroit plant.

Michigan Alkali Co. has started a new $1,000,000 plant in Wyandotte, Mich., for production of chlorine and caustic soda by a new English process.

In practically all the above expansions, personnel needs have been filled, or arrangements have been made to fill them. It would be a waste of time, it is said, for jobseekers to contact these interests at present.

CHICAGO

Steel companies in the Chicago area largely have completed the extensive improvement programs started during the past several years, and present work merely is the completion of final phases of such programs.

International Harvester Co. currently is engaged in a large extension program, and this work is being carried on to completion. The major item is a new plant at Indianapolis for the production of truck engines. This work, costing over $4,000,000, includes several buildings. The engine plant is expected to be completed in April with the foundry buildings to be finished later in the year.

International Harvester will complete a $1,000,000 enlargement to its tractor works in Chicago about June. This plant manufactures the crawler type tractor. Other construction by the Harvester company now going on includes a $100,000 enlargement of its Milwaukee plant; a $200,000 replacement of its Canton, Ill., plant, which was damaged by fire; and a $100,000 building at its Tulsa, Okla., motor sales branch.

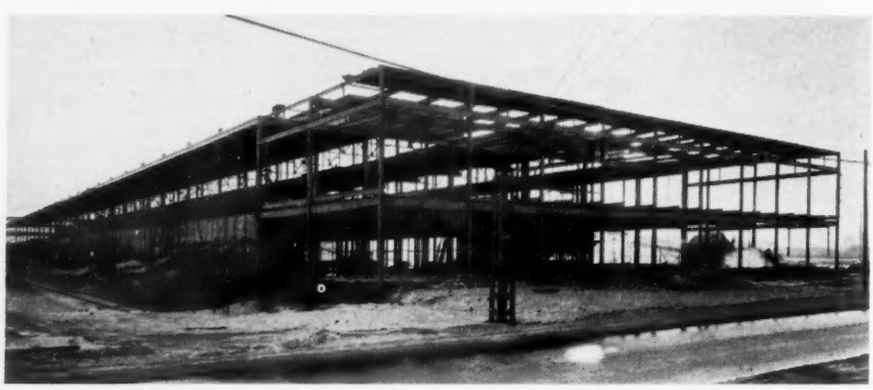
Another major project being undertaken is a new $2,000,000 plant to be built in Australia. Most of the equipment and materials to be used in building this plant will come from this country.

Illinois Zinc Co. recently placed a contract with the Austin Co., Cleveland, for its new strip mill building to be built in Chicago. This is a $500,000 project and represents the first zinc strip rolling mill to be built in the Chicago district.

Socony Paint Products Co. is making plans for an addition to its Chicago district plant, to cost $100,000, including equipment. Federated Metals Corp. is proceeding with its new $1,000,000 plant at Whiting, Ind., while United Airlines is spending $200,000 for a new office building at the Chicago municipal airport.

Major industrial plant work not

Briggs' $3,000,000 Parts Plant Nears Completion



■ **By March 1, the new $3,000,000 parts manufacturing plant of Briggs Mfg. Co., Detroit, will be completed, and equipment installed for fabrication and finishing of moldings and other automobile body parts**

affiliated with the metalworking industry includes a new $250,000 plant for the Coca-Cola Bottling Co. of Chicago; a $250,000 addition to the plant of Regensteiner Corp., printers; and a new $100,000 building for the Meyercord Co., decalcomania manufacturers.

NEW YORK

The Du Pont interests, Wilmington, Del., are going ahead with an extensive program of expansion.

Oil companies for the most part are proceeding with routine maintenance work although in at least one important case, the Sun Oil Co., Philadelphia, recently announced a new $11,000,000 program with much work to be undertaken at Marcus Hook, Pa.

A relatively short time ago hope was held for a boom in 1938 in power construction. However, a recent survey of major utilities systems indicates new construction will be about 15 per cent lower to around $386,000,000, against $455,000,000 in 1937. This, which applies to the country as a whole, is believed to be indicative of the situation in this district.

Certain routine work is going ahead, but from present indications there will be no spurt in new construction.

PITTSBURGH

Bell Telephone Co. of Pennsylvania will spend $9,800,000 for additions, replacements and improvements in plant facilities in Pittsburgh and western Pennsylvania. This represents an increase of approximately $2,000,000 over the 1937 program.

Aluminum Co. of America has announced it is going ahead with its $26,000,000 program now underway.

BIRMINGHAM

Major projects in steel and related industries underway and projected, are in excess of $50,000,000.

The Tennessee Coal, Iron & Railroad Co. is completing tin plate mill, costing more than $30,000,000.

Republic Steel Corp.'s Gadsden program includes two new open hearth furnaces and an addition to the sheet mill at an expenditure of $2,500,000.

Universal-Atlas Cement Co. (U. S. Steel Corp. subsidiary) at Leeds, Ala., is spending approximately $3,000,000 in rebuilding and modernizing the plant to change from the dry to the wet process.

Construction of a bauxite smelting plant at Mobile by Aluminum Ore Co., at estimated cost of $5,000,000 is nearing completion.

Electro Metallurgical Co. recently announced plans had not yet progressed to the point of beginning construction on its proposed $5,000,000 plant at Sheffield, in the Muscle Shoals area, but indicated there will be no change in the original program.

Galloway Coal Co. will spend nearly $300,000 at Carbon Hill, Ala., where a new mine is being opened and modern tipple facilities erected.

CLEVELAND

Industrial Rayon Corp. will erect a plant, costing between $7,000,000 and $10,000,000, for manufacture of cut staple.

Ohio Bell Telephone Co. will spend $7,650,000 for plant improvements and new equipment. Ohio Electric Mfg. Co. is erecting a three-story factory building.

Otis Steel Co. is proceeding with its $4,000,000 expansion program which includes one 77-inch four-high cold strip mill and one 77-inch four-high hot strip mill.

American Steel & Wire Co. is continuing Cuyahoga works expansion, which includes extension and improvement of facilities for making cold strip and additional heat treating equipment.

At Canton, O., Timken Roller Bearing Co. has announced $450,000 will be spent for improvements, including a 50-ton electric furnace which will increase capacity 25 per cent to 20,000 tons a month.

BUFFALO

Buffalo Niagara Electric Corp. plans $5,000,000 expansion and improvement program, including new terminal station costing $1,500,000 and installation of 1,125,000 feet of underground cables. Entire program will be completed this year.

Chevrolet Motors is completing a new $2,500,000 axle and motor plant on River road. Machinery valued at $6,000,000 now is being installed. Company also has in course of construction $700,000 radiator and lamp plant at Lockport, N. Y.

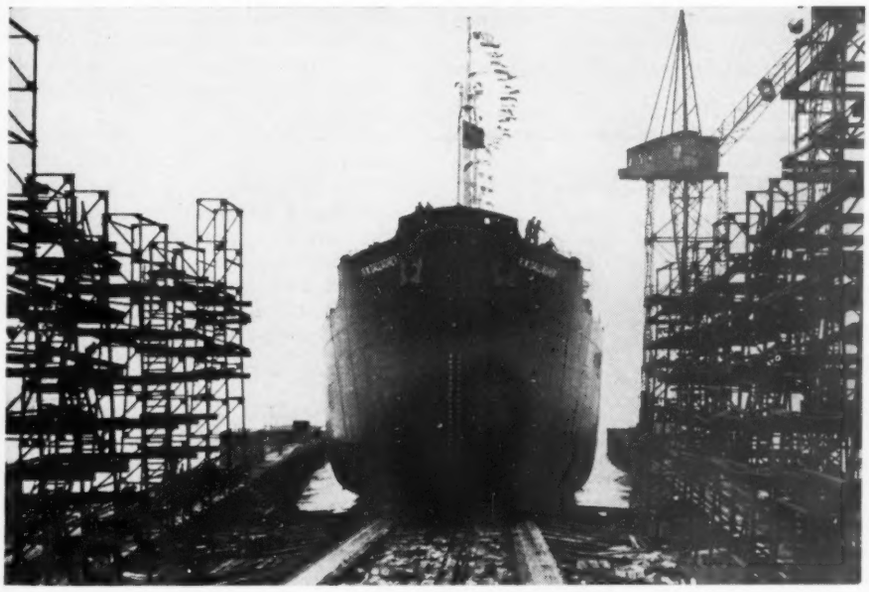
Associated Dry Goods Corp. is completing $1,000,000 expansion and improvement program to William Hengerer & Co. store, a subsidiary. Ground was broken this month for a seven-story building addition.

Spencer Lens Co. has purchased 25 acres in Cheektowaga, N. Y., for a new building, construction to start soon.

National Aniline & Chemical Co.

(*Please turn to Page* 104)

Bethlehem Builds 1509th Ship



■ Latest addition to the Standard Oil Co.'s fleet is this tanker R. V. GALLAGHER, launched at the Sparrows Point, Md., yards of Bethlehem Shipbuilding Corp. Ltd., Jan. 22. It was the 1509th ship built by Bethlehem, and the 318th ship and 42nd tanker launched at Sparrows Point.

The vessel is 13,000 tons deadweight and can carry 106,400 barrels of oil in 24 compartments. Length is 463 feet, beam 64 feet, depth 34 feet 10 inches, and draft 28 feet 4 inches. It is of the Bethlehem-Frear design, a new type of hull construction developed for greater efficiency in carrying liquid cargoes. Quarters for officers and men are of fireproof construction with doors and furniture entirely of metal.

The ship was sponsored by Mrs. R. V. Gallagher, wife of the vice president and director of Standard Oil Co. of New Jersey for whom the vessel is named.

Cartel Delegates Seeking Pact on Many Products

NEW YORK

■ TO RENEW efforts in interesting American producers of heavy products in a close working agreement with the European steel cartel, a number of important foreign steel representatives arrived here late last week. Only previous visit of the delegation was in June, 1936.

Heading the delegation is Hector Dieudonne, director general of the cartel, which is now known officially as the Comptoir Metallurgique Luxembourgeois, with headquarters in the city of Luxemburg. Others are the Earl of Dudley, chairman, the British Iron and Steel federation, the selling and buying agent for the cartel; I. F. L. Elliott, managing director of the federation; Spencer Summers, a director of the federation.

Negotiations are being conducted officially through the Steel Export association, 75 West street, organized a few years ago under the Webb-Pomerene act by a number of leading steel producers to engage in export trade. This association has been interested primarily in tin plate, but was originally set up to include, if desirable, all iron and steel products. The association has been participating in the tin plate cartel abroad, an affiliate of the steel cartel.

American producers also had a working arrangement with European cartels on pipe. It is to induce American producers to participate in some agreement on such products as plates, shapes and bars, that the visiting delegation is now said to be especially interested.

Spokesmen for the delegation, however, denied the purpose of the visit is to enter into a price fixing agreement with American producers.

Despite this statement considerable speculation prevails as to what ultimate effect conversations of the next few days will have on the future relationship between domestic and foreign sellers in the world market.

Many Complications Exist

Admittedly there are many complications. Many more interests produce the various lines of steel now under consideration than make tin plate or pipe. To get all American producers into line in making a good working agreement effective is considered by some as an almost insurmountable task.

For one reason it is difficult because many of the steel sellers have never been particularly interested in exporting. Some are not geographically situated to take full advantage of export demand and have, consequently, no organizations to handle such trade. Their interest has been primarily in domestic sales. Normally almost 95 per cent of the steel produced in America is for domestic requirements.

Other producers have made foreign trade a matter of long study and development and have highly perfected organizations for handling world trade here and abroad. Would these interests be inclined to share the business they might normally expect to obtain as a result of their own past efforts?

Last year, especially as the domestic market began to slump sharply, many sellers of steel products attracted by reports of premiums on export tonnage in the first six to eight months of the year, made a scramble for this business. Some obtained attractive orders, but the majority, unfamiliar with complexities of export business, found themselves getting nowhere and subsequently withdrew. Moreover, export business began to lose lustre as foreign price offerings dropped.

Some leading steel exporters are inclined to believe that if all domestic sellers would co-operate in a working agreement with the foreign cartel, it might in the long run prove best for all. Europe has been experimenting with cartels for many years and some have proved highly profitable. However, it is admitted producers abroad are not confronted with the same situation prevailing here.

Present negotiations should have no effect on steel imports. The Webb-Pomerene act permits concerted action among domestic producers on exports, but not on imports.

Exerts Stabilizing Influence

Little disposition on the part of the conferees to spend much time on a discussion of methods for invading each other's home territories is likely. Interest, it is believed, will be centered upon needs of the non-steel producing countries, Mexico, China, the South American countries and Africa.

American producers who have participated in foreign cartel activities on tin plate and pipe declare foreign operations have been generally satisfactory, and that the cartel has exerted a strong stabilizing influence.

Last year world shortage of tin plate enabled American producers to obtain prices well above cartel quotations.

But this was an unusual situation and the influence of the organiza-

"Spider Net" of Steel To Trap Light Tanks

■ **Interlocking coils of special steel wire are said to be strong enough to stop light tanks and armored cars, when they become enmeshed in them. Here the first battalion, South Staffordshire regiment, is receiving instructions in the practical handling of the coils, at Mytchett, Aldershot, England. Steel in this form and for this purpose may play an important part in the next war.**
Wide World photo

tion before that was to keep tonnage flowing smoothly in well defined channels and at prices fair to producers and consumers alike. It curbed cut-throat competition among producing countries which would have left all with little or no profit, it is declared.

Conditions today have changed. Not only is there a decidedly less active market in steel in this country, but an easier tendency in other countries. In tin plate the cartel stands likely to again come into its normal function and the general outlook is such that producers of other products stand to benefit by a similar arrangement.

Observers who claim export business normally runs in cycles of about seven or eight years, believe last year may represent a peak in the present cycle. In an especially active year there are usually certain outstanding influences. Last year was the heavy demand from Japan and England for semifinished steel, pig iron and scrap. Armament work was an important factor.

England now appears to have her armament program fairly well in hand and there is a somewhat lesser activity in steel in general in that country. Japan may continue an active buyer through 1938.

Japan Still a Good Market

Leading exporters consider Japan a continuing good outlet for American steel. Despite Japan's war requirements, she is using an increasing amount of steel domestically—for roads, buildings and many other purposes. Even should war requirements taper sharply in coming months, there would still be a good demand for steel. Japan is enlarging producing facilities, but is handicapped by scarcity of raw materials and will not be able to keep pace with her growing needs for some years.

Among members of the present delegation who were prominent in negotiations two years ago are the Earl of Dudley and Mr. Elliott. Upon the last occasion a dinner was held on the QUEEN MARY which was attended by Myron C. Taylor, chairman, United States Steel Corp., and Eugene G. Grace, president, Bethlehem Steel Co., and by members of their executive staffs. Following the dinner, Mr. Taylor said the foreign visitors had outlined their proposals, but that "we don't know whether these same plans would apply to us with benefit."

American producers have been following closely developments on the other side and have had "unofficial observers" in attendance at various meetings of the cartel.

Leading members participating in the cartel are England, France, Germany, Poland, Czechoslovakia, Austria, and the Belgium-Luxembourg Economic Union.

Quarterly and Annual Earnings Summarized

	Fourth quarter 1937	Fourth quarter 1936	Year, 1937	Year, 1936	Ingot Capacity Gross tons
United States Steel Corp...	$4,577,983	$20,923,995	$99,930,836	$50,798,900	25,772,400
Bethlehem Steel Corp.....	4,253,375	5,291,492	31,819,596	13,901,006	10,040,000
Republic Steel Corp.	*247,323	3,253,273	9,044,147	9,586,922	6,452,000
National Steel Corp.	2,580,925	4,628,729	19,516,892	13,171,148	3,400,000
Youngs. Sheet & Tube Co..	1,696,022	3,719,115	12,190,649	10,564,501	3,120,000
Inland Steel Co.	867,571	3,867,625	12,665,317	12,888,647	2,340,000
Pittsburgh Steel Co.....	*420,439	261,870	657,272	*265,360	720,000
Rustless Iron & Steel Corp.	82,212	122,434	713,123	350,707	†23,000
TOTALS	$13,390,326	$42,068,533	$186,537,832	$110,996,471	51,867,400
FINISHING CAPACITY ONLY					
Acme Steel Co.	*$171,341	$711,022	$1,898,904	$2,157,677	.....
Superior Steel Corp....	*70,736	256,798	239,526	454,943	.....

*Loss. †Stainless steel ingots.

Year's Aggregate Profit for Eight Steel Producers Up 68.6 Per Cent

■ NET PROFITS in 1937 for the eight leading steel producers which have reported increased in aggregate 68.6 per cent over 1936.

These eight—United States Steel Corp., Bethlehem Steel Corp., Republic Steel Corp., National Steel Corp., Youngstown Sheet & Tube Co., Inland Steel Co., Pittsburgh Steel Co. and Rustless Iron & Steel Corp., represent approximately 75.7 per cent of total ingot capacity.

Their profits for 1937 total $186,537,832, compared with $110,996,471 in 1936. Profits for the same interests in the final quarter of 1937 amounted to $13,390,326, compared with $42,068,533 in the quarter in 1936.

Steel ingots were produced in the fourth quarter at an average operating rate of 40.63 per cent. In October the rate was 58.31 per cent; November, 38.22 per cent; and December, 25.36 per cent.

NATIONAL STEEL SHOWS SUBSTANTIAL GAIN FOR YEAR

National Steel Corp. reported preliminary net earnings for 1937, after all charges, including interest, taxes, depreciation and depletion, but before provision for the undistributed profits tax, as $19,516,-

Steelworkers Become Skilled at Night School

■ **Enrolled in the night welding classes at the Youngstown Sheet & Tube Co.'s Brier Hill welding shop are 225 men. Two classes are held each night, five nights a week, under direction of the general foreman and assistants. This is one feature of the work being done by leading steel companies to train employes for skilled occupations**

892.67, equal to $9 per share on 2,167,877 shares of outstanding capital stock. This compares with $13,171,148.80, or $6.09 per share, earned before undistributed profits tax in 1936.

After deduction of provision for undistributed profits tax amounting to $1,715,000.00, net earnings for 1937 equal $17,801,892.67, or $8.21 per share, compared with $12,541,341.84, or $5.80, earned in 1936 after undistributed profits tax.

For the final quarter of 1937, earnings before the undistributed profits tax amounted to $2,580,925.51, or $1.19 per share, compared with $4,628,729.44, or $2.14 per share, in the corresponding quarter of 1936. Comparable earnings in the third quarter 1937 were $5,227,071.04, or $2.41 per share.

REPUBLIC'S NET PROFIT FOR YEAR $9,044,147

Republic Steel Corp. reports net income for 1937 as $9,044,147 after all charges and taxes, including surtax on undistributed profits. This compares with $9,586,922 for 1936.

Provision for depreciation and depletion amounted to $10,756,485; and $10,130,485 in the previous year. Estimated federal income tax and surtax on undistributed profits for 1937 will approximate $3,300,000, against $3,000,000 in 1936.

Net profits of 1937 were at the rate of about $1.14 per share on slightly more than 5,800,000 shares of common stock outstanding.

U. S. STEEL TAXES EXCEED EARNINGS FOR NINE YEARS

From the beginning of 1928 to the end of 1936, United States Steel Corp. paid taxes in the sum of $379,000,000, according to an article "Who Pays The Taxes" in the February issue of *US Steel News*.

During this period, the corporation, after paying $77,000,000 as interest on bonds, had left over for the owners the sum of $364,000,000, a return of less than 2.5 per cent on investment. In this same period the corporation paid $2,502,000,000 in wages and salaries.

The article points out that units of government, "which had put no savings into the properties and had taken no risk", received $15,000,000 more than the owners, who ventured their savings and created $2,502,000,000 in wages and salaries.

"In the years 1928 and 1929 earnings were high in comparison with taxes. In every year since 1930, taxes have exceeded earnings," it says. "During the three years 1932 through 1934 when the company operated at a loss, taxes amounted to $99,000,000. In 1936, with earnings of $50,500,000, taxes were $52,800,000."

In the nine years the taxes paid were equivalent to about 11/3 years' wages and salaries.

Safety Insurance Almost Equals Bridge Scrap Value

■ Although engineers were unable to devise a safe and methodical method of salvaging the scrap steel in the Falls View bridge, at Niagara Falls, N. Y., acetylene torches and explosives were used last week to cut it into small pieces.

Workers employed by the bridge company started on the American side but were forced to retreat when this end sank 30 feet into the water. Then they began on the Canadian side.

Scrap and wrecking concerns gave up the idea of salvaging the metal, which was valued at $31,000. It was disclosed that insurance and compensation liability for workers would amount to $20,000 to $25,000.

The Ontario Hydro-Electric Power commission's plant at the foot of Horseshoe Falls has been damaged by ice to the extent of $1,000,000. The commission fearing further damage if the wrecked bridge remains in the river is seeking to compel the bridge company to remove it.

Hear Government Experts On Export Restrictions

■ A subcommittee of the senate military affairs committee met last Friday in executive session to hear government experts on essential metals in connection with bills pending to restrict exports except under license.

Representatives of the state, war, navy, interior and commerce departments were present. Senator Thomas, Utah, chairman, stated the subcommittee had completed a preliminary study and will report to the military affairs committee next Thursday. There is no change in the attitude of the subcommittee to hold open hearings relative to bills pertaining to scrap, at a date to be set later.

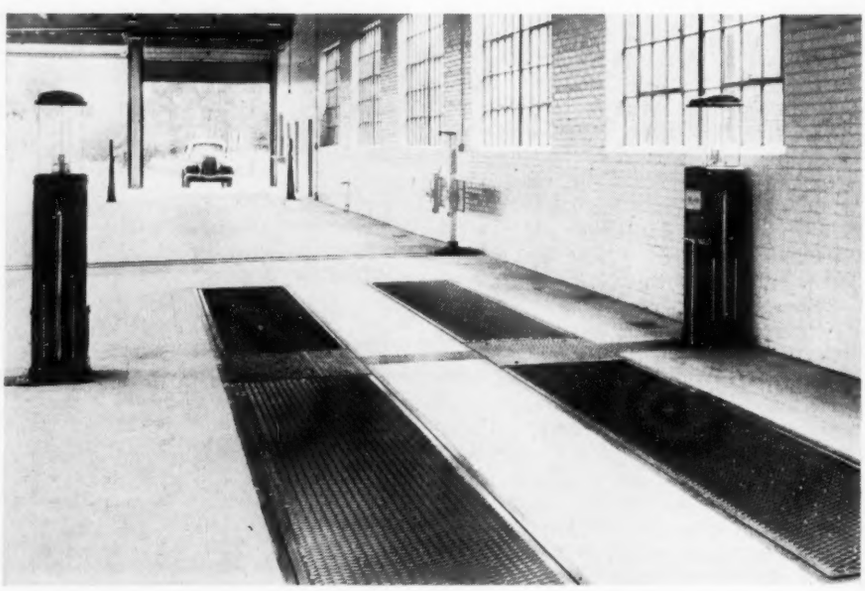
Complaint Filed Against Office Equipment Makers

■ Fixing of prices for steel office furniture and equipment is alleged by the federal trade commission in a complaint issued against 14 manufacturers, five dealers, and the trade association of each group. The manufacturers are said to produce 85 per cent of all the steel office furniture and equipment sold in the United States.

Steel Office Furniture institute, Cleveland, and Tidewater Office Equipment Dealers' association, Norfolk, Va., are the respondent trade associations.

■ Senator Wagner, New York, introduced a bill last Friday requiring beneficiaries of government contracts, loans or grants to comply with the national labor relations act.

Steel Finds Liberal Use in Motorcar Testing Stations



■ **Use of steel in ways related to automotive transportation continues to grow, as evidenced by this view of an inspection station in New Jersey. Floorplates, brake, headlight and wheel alignment testing devices all are of steel. New Jersey has 28 such stations containing 45 lanes. Other states are adopting similar measures to promote highway safety**

PRODUCTION

■ CHANGES in operating schedules to match light buying resulted last week in loss of 2 points to 31 per cent in the national rate.

Youngstown, O.—Drop of 1 point to 26 per cent for last week. Indications are that at the beginning of this week operations will be at 21 per cent, rising to 23 at midweek. Carnegie-Illinois Steel Corp. will close its plant at Farrell, Pa., for some finishing mill changes. Sharon Steel Corp. and Youngstown Sheet & Tube Co. will add some capacity.

Buffalo—With Republic Steel Corp. ingot production completely down the rate lost 4.5 points to 14 per cent. Six of 43 open hearths are active. An increase this week is indicated.

Cleveland—Addition of an open hearth by one interest carried the rate up 2 points to 33 per cent, with indications for the same rate this week.

Pittsburgh — Readjustments in schedules pushed the operating rate up 2 points to 32 per cent.

Wheeling — Down 2 points to 44 per cent, which is expected to be continued through this week.

Cincinnati — Up 4 points to 44 per cent. Because of staggered schedules the rate this week is expected to be slightly lower.

Birmingham, Ala. — Increased 3 points to 63 per cent by addition of an open hearth at Gadsden, Ala.

Detroit — Declined 5 points to 47 per cent as one open hearth was dropped. Further reduction is indicated unless demand increases.

Chicago — Off 2 points to 25 per cent, the net result of lower operations by two producers and an increase by another.

New England — Unchanged at 20 per cent for the third consecutive week. One 100-ton open-hearth went into service Saturday, however, and this week's rate will be several points higher.

Central eastern seaboard — Receded 1 point to 30 per cent. Most mills hold the rate of the past two or three weeks but slight dips in two instances are not quite balanced by a gain in another.

St. Louis — Gained 8 points to 29 per cent.

Bar Iron Wage Unchanged

■ Bar mill wage settlement for February agreed between the Western Bar Iron association and the Amalgamated Association of Iron, Steel and Tin Workers is unchanged from the January rate. The base for boiling, bar and 12-inch mills is $2.45 and for guide and 10-inch mills, $2.55.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Feb. 5	Change	Same week 1937	Same week 1936
Pittsburgh	32	+ 2	82	40
Chicago	25	− 2	78	58
Eastern Pa.	30	− 1	53.5	36.5
Youngstown	26	− 1	81	61
Wheeling	44	− 2	77	81
Cleveland	33	+ 2	75.5	61.5
Buffalo	14	− 4.5	85	32
Birmingham	63	+ 3	79	63
New England	20	None	74	83
Cincinnati	44	+ 4	22	80
St. Louis	29	+ 8	82	†
Detroit	47	− 5	90	88
Average	31	− 2	79.5	53

†Not reported.

New York Auto Show Deferred Until Nov. 11

■ In response to widespread demands from dealers throughout the country, the Automobile Manufacturers' association decided last week to defer the 1938 automobile show opening in New York until Armistice day, Friday, Nov. 11, two weeks later than the New York show last year. Shows in other cities will be scheduled for the succeeding weeks after Nov. 11.

Byron C. Foy, chairman of the A.M.A. show committee and president of the De Soto division of Chrysler Corp., stated that the only way to make automobile shows and new model announcements coincidental was to schedule the Grand Central Palace show at the later date.

Truck manufacturers represented in the association voted against holding a national truck show this year.

World Tin Production Sets New Record

■ World tin production in December reached an all-time record of approximately 26,000 tons, according to the International Tin Research and Development council. Production for the year 1937 was about 206,000 tons, compared with 180,000 tons in 1936, and exceeding the previous record, 1929, by 7 per cent.

World consumption in 1937 is estimated at 181,500 tons, although more complete information may bring this figure to about 194,000 tons.

Consumption by all principal countries except France increased in the year ended November, 1937. United States' consumption showed a gain of 18.9 per cent to 85,924 tons, 47 per cent of the world total.

Quality of Steels Rises, Costs Fall

■ PRICES of steel products over the past 15 years have not reflected the marked improvements in quality, according to the American Iron and Steel institute. Improvements have brought substantial manufacturing economies to consumers and have made for new and better products.

Outstanding instances where the increase in quality has not been reflected in prices are sheet steel for making automobile fenders and washing machine tubs, and alloy steel bars for transmission gears.

Total net selling price during 1937 of steel sheets for making one-piece washing machine tubs was 42 per cent lower than in 1923 and 26 per cent lower than in 1929.

So improved is the quality that washing machine manufacturers can produce a tub in a single forming operation, and obtain a fine finish with only one coat of enamel. By contrast, between 1923 and 1929, two forming operations, an intermediate heat treatment, and three or more coats of priming material and enamel were required.

Fabricating Costs Lowered

Automobile fender stock has been so improved that while one forming operation now produces the one-piece torpedo-type fender which distinguishes the recent models, it would have been practically impossible 15 years ago to produce such a fender from one piece of steel.

Furthermore, the finish of the steel today is so improved that only one priming coat and one finishing coat is needed, against two priming and two finishing coats, and three polishing operations in 1923.

Price of sheet steel for fenders in 1937 was 46 per cent less than in 1923, and 29 per cent below 1929.

Improvements in gear steel quality have resulted in more uniform and longer lasting gears. Gearmakers find manufacturing costs reduced as a result, but steel manufacturer's costs have increased through necessity for more precise control of chemical composition, and more exacting and frequent tests.

Price of a typical gear steel in 1937 was 19 per cent below 1923, and only 7 per cent above 1929.

■ Four additional manufacturers recently were admitted to membership in the American Supply & Machinery Manufacturers' association, Pittsburgh. They are: Wells Mfg. Co., Three Rivers, Mich.; Kinney Mfg. Co., Boston; Eagle Belt Lacer Co., Stratford, Conn.; and Laminated Shim Co., Long Island City, N. Y.

MEETINGS

FOUNDRY EQUIPMENT GROUP GIVES MEETING DETAILS

■ Program for the annual meeting of the Foundry Equipment Manufacturers' association at the Terminal club, Cleveland hotel, Cleveland, Feb. 8, includes a survey of business, committee reports, election of directors, an open forum and several addresses.

Among the addresses and speakers are the following: "Foundry Equipment Builders and the Government," by Lewis M. Lind, chief machinery division, department of commerce, Washington; "Present-Day Cost Considerations," by Albert E. Grover, consultant, Cleveland; "Progress in Safety and Hygiene Codes," by Dan M. Avey, secretary, American Foundrymen's association, Chicago; and "Exhibit of Foundry Equipment and A.F.A. Convention," by C. E. Hoyt, manager of exhibits, American Foundrymen's association, Chicago.

A.F.A. NAMES COMMITTEES FOR CONVENTION AND SHOW

Officers of the Northeastern Ohio chapter of the American Foundrymen's association have been named to head up the local executive committee for the forty-second annual convention and exhibition of the American Foundrymen's association in Cleveland, May 14-19.

B. G. Parker, Youngstown Foundry & Machine Co., Youngstown, O., is general chairman; Leroy P. Robinson, Werner G. Smith Co., Cleveland, general vice chairman; John Tressler, Hickman, Williams & Co., Cleveland, general secretary; and R. F. Lincoln, Osborn Mfg. Co., Cleveland, general treasurer. Serving also on the executive committee are chairmen and vice chairmen of the 11 special committees.

A.S.T.M. COMMITTEES PLAN SPRING GROUP MEETINGS

Important committees of the American Society for Testing Materials will hold their spring group meetings at the Seneca hotel, Rochester, N. Y., March 7-11. Some 100 meetings are scheduled at which the committees will review their active research and standardization programs and discuss various recommendations on changes in standards and new standards which may be reported to the society at its annual meeting in June.

In connection with the group committee meetings, the society will conduct its annual regional meeting on March 9 with a symposium on plastics as the principal feature.

Among committees convening during the week are: A-1 on steel, A-2 on wrought iron, A-5 on corrosion of iron and steel, A-7 on malleable iron castings, A-10 on iron-chromium-nickel alloys, A-3 on cast iron, B-3 on corrosion of nonferrous metals, B-5 on copper and copper alloys, B-6 on die cast metals and alloys, B-7 on light metals and alloys, D-3 on gaseous fuels, D-5 on coal and coke, D-20 on plastics, E-2 on spectrographic analysis, research committee on fatigue of metals, joint committee on effect of temperature on properties of metals, technical committees and sections of committee E-1 on methods of testing.

GEAR MAKERS CHANGE ANNUAL MEETING DATE

American Gear Manufacturers' association has changed the date of its twenty-second annual meeting from April 18-20 to April 25-27. The place is the General Brock hotel, Niagara Falls, Canada.

Papers to be presented include: "Ball Bearing Design for Modern Heavy Duty," by Thomas Barish, Marlin Rockwell Corp.; "Chain and Sprocket Drives," by J. S. Watson, Link-Belt Co.; "Characteristics of General-Purpose Motors," by I. Koenig, Reliance Electric & Engineering Co.; "Conjugate Tooth Forms," by W. P. Schmitter, Falk Corp.; "Gear Sounds," by R. S. Drummond, National Broach & Machine Co.; "Industrial Photography," by J. L. Boon, Eastman Kodak Co.; "Nonmetallic Materials," by H. R. Moyer, Westinghouse Micarta Works; "Practical Problems in Handling Men," by F. H. Fowler, Foote Bros. Gear & Machine Co.; "Rates of Depreciation," by H. N. Mathias, Westinghouse Electric & Mfg. Co.; "University Training of Mechanical Engineers," by Prof. Frank Mickle, University of Michigan; "Welding," by H. S. Card, National Electrical Manufacturers' association; "Lubricating Oils," by representative of Standard Oil Co.

PITTSBURGH TRAFFIC MEN PLAN ANNUAL DINNER

Traffic and Transportation Association of Pittsburgh will hold its annual dinner at the William Penn hotel, Pittsburgh, Feb. 17. W. M. Jeffers, president, Union Pacific railroad, Omaha, Neb., is to be the principal speaker and C. W. Galloway, vice president, Baltimore & Ohio railroad, toastmaster.

CHAMBER OF COMMERCE'S ANNUAL MEETING MAY 2-5

Chamber of Commerce of the United States will hold its twenty-sixth annual meeting in Washington, May 2-5. The National council will meet on May 2 and the opening session will be on the following morning.

Convention Calendar

Feb. 8—Foundry Equipment Manufacturers' association. Annual meeting at Cleveland hotel, Cleveland. A. J. Tuscany, 632 Penton building, Cleveland, is executive secretary.

Feb. 9-10—Steel Founders' Society of America. Annual meeting at Hotel Cleveland, Cleveland. R. L. Collier, 920 Midland building, Cleveland, is secretary.

Feb. 10-12—Iron, Steel and Allied Industries of California. Fourteenth annual conference at Del Monte, Calif. C. S. Knight, director, industrial department, California State chamber of commerce, San Francisco, is secretary.

Feb. 14-18—American Institute of Mining and Metallurgical Engineers. 148th meeting at Engineering Societies building, New York. A. B. Parsons, 29 West Thirty-ninth street, New Cork, is secretary.

Feb. 24-25—Southern Foundry Conference. Sixth annual conference of Birmingham chapter, American Foundrymen's association, and Birmingham section, American Society of Mechanical Engineers, at Hotel Tutweiler, Birmingham, Ala.

March 7-8—American Gas Association. Annual industrial gas sales conference of industrial gas section at William Penn hotel, Pittsburgh. Kurwin R. Boyes, 420 Lexington avenue, New York, is secretary.

March 8-10—British Institute of Metals. Thirtieth annual meeting at Institution of Mechanical Engineers, London. G. Shaw Scott, 36, Victoria street, Westminster, London, S.W. 1, is secretary.

March 9—American Society for Testing Materials. Regional meeting at Seneca hotel, Rochester, N. Y., in conjunction with spring group meetings of committees, March 7-11. C. L. Warwick, 260 South Broad street, Philadelphia, is secretary.

March 9-12—American Society of Tool Engineers. First national convention and exhibition at Convention Hall, Detroit. Ford R. Lamb, 5928 Second boulevard, Detroit, is executive secretary.

March 10-11—Society of Automotive Engineers. National aeronautic meeting at Mayflower hotel, Washington. John A. C. Warner, 29 West Thirty-ninth street, New York, is secretary and general manager.

March 14-15 — National Association of Waste Material Dealers. Annual meeting at Hotel Astor, New York. C. M. Haskins, 1109 Times building, New York, is secretary.

March 21-22—Liquefied Petroleum Gas association. Formerly National Bottled Gas association. First meeting in St. Louis. F. R. Fetherston, 11 West Forty-second street, New York, is secretary.

March 21-25—American Society for Metals. Third Western Metal congress and exposition at Pan-Pacific auditorium, Los Angeles. W. H. Eisenman, 7016 Euclid avenue, Cleveland, is secretary.

March 21-25—American Welding society. Regional meeting of Pacific Coast sections at Biltmore hotel, Los Angeles.

March 25—Gray Iron Founders' society. Annual meeting at Statler hotel, Buffalo. W. W. Rose, 33 Public Square building, Cleveland, is executive vice president.

March 27—April 2—American Ceramic society. Annual convention at Roosevelt hotel, New Orleans. Ross C. Purdy, 2525 North High street, Columbus, O., is secretary.

January Iron Loss Small; Decline Appears Checked

■ JANUARY production of coke pig iron suffered only a moderate loss from the December level and bore an indication that drastic curtailment of operations may be near an end. Losses in both total and average daily output, and in active blast furnaces, were the smallest for any month since the recession started last September.

Average daily production in January was 46,426 gross tons, a drop of only 2073 tons, or 4.3 per cent, from the December daily rate of 48,499 tons. The January rate was the lowest for any month since December, 1934, with 33,161 tons, and the smallest for January in any year since 1934, when the rate was 39,537 tons. Daily output in January, 1937, was 103,863 tons.

Total output in January amounted to 1,439,191 gross tons, which, compared with the 1,503,474 tons made in December, was a decrease of 64,283 tons, or 4.3 per cent. This total was the smallest since December, 1934, with 1,028,006 tons, and constituted the poorest January showing since 1934, when 1,225,643 tons was produced. In January, one year ago, output was 3,219,741 tons.

MONTHLY IRON PRODUCTION
Gross Tons

	1938	1937	1936
Jan.	1,439,191	3,219,741	2,029,304
Feb.		3,020,006	1,838,932
March		3,470,470	2,046,121
April		3,400,636	2,409,474
May		3,545,180	2,659,643
June		3,115,302	2,596,528
July		3,501,359	2,595,791
Aug.		3,616,954	2,711,726
Sept.		3,417,960	2,728,257
Oct.		2,891,026	2,991,794
Nov.		2,007,031	2,949,942
Dec.		1,503,474	3,125,192
Total		36,709,139	30,682,704

Relating production to capacity, operations in January averaged 34.2 per cent, compared with 35.6 per cent in December, 49.1 in November, 68.4 in October, 83.7 in September, and 85.7 in August, the latter being the high point for 1937. In January, a year ago, operations averaged 76.6 per cent.

Active blast furnaces on Jan. 31 totaled 91, a loss of 2 from the 93 making iron at the close of December. The January total was the smallest for any month since June, 1935, also with 91. Beginning with the 1937 peak of 192 operating stacks in July, the number declined to 191 in August, 181 in September, 151 in October, 114 in November, and 93 in December. Thus the loss of 2 furnaces in January was the smallest for any month since August and indicates that decline has been arrested.

AVERAGE DAILY PRODUCTION
Gross Tons

	1938	1937	1936	1935
Jan.	46,426	103,863	65,461	47,692
Feb.		107,857	63,411	57,675
March		111,951	66,004	57,120
April		113,354	80,316	55,719
May		114,360	85,795	55,986
June		103,843	86,551	51,949
July		112,947	83,735	49,043
Aug.		116,676	87,475	56,767
Sept.		113,932	90,942	59,009
Oct.		93,259	96,509	63,818
Nov.		66,901	98,331	68,876
Dec.		48,499	100,813	68,242
Ave.		100,573	83,832	57,694

During January, 4 steelworks or nonmerchant stacks resumed activity and 4 were blown out or banked, leaving the total for this class unaffected. Of the merchant units, 2 were made active and 4 were taken out, making a net loss of 2 stacks for this class.

Furnaces blowing out or banking during January were: One Cleveland, Otis Steel Co.; Anna, Struthers Iron & Steel Co. In Pennsylvania: Eliza No. 3, Jones & Laughlin Steel Co. In New York: Lackawanna G, Bethlehem Steel Co.; Standish, Chateaugay Ore & Iron Co. In Alabama: North Birmingham No. 4, Sloss-Sheffield Steel & Iron Co. In Illinois: One South Chicago, Wisconsin Steel Works. In Michigan: Benson, Ford Motor Co.

Stacks going in were: In Ohio: One Mingo, Carnegie-Illinois Steel Corp. In Pennsylvania: One Monessen, Pittsburgh Steel Co. In New York: Lackawanna J, Bethlehem Steel Co. In Maryland: Maryland C, Bethlehem Steel Co. In Alabama: One Pioneer, Republic Steel Corp.; one Woodward, Woodward Iron Co.

Bethlehem Steel Co. has abandoned furnace H at its Lackawanna, N. Y., plant. This furnace, built in 1905 and last rebuilt in 1935, had an annual capacity of 237,600 tons of basic, bessemer, foundry and malleable iron. With removal of this stack, total number of potential furnaces in the country is reduced from 237 to 236.

JANUARY IRON PRODUCTION

	No. in blast last day of Jan.	No. in blast last day of Dec.	Total tonnage Merchant	Total tonnage Nonmerchant
Ohio	19	20	60,941	228,522
Penna.	29	29	59,574*	350,504*
Alabama	12	11	72,108*	96,893*
Illinois	6	7	44,860	83,135
New York	7	8	56,262	60,132
Colorado	1	1		
Indiana	7	7	14,763	218,092
Maryland	4	3		
Virginia	0	0		
Kentucky	1	1		
Mass.	0	0		
Tenn.	0	0		
Utah	1	1	6,790	86,615
West Va.	1	1		
Michigan	2	3		
Minnesota	1	1		
Missouri	0	0		
Total	91	93	315,298*	1,123,893*

*Includes ferro and spiegeleisen.

Canada's Imports from United States Increase

■ Canada's steel imports in December were valued at $14,456,000, compared with $12,172,000 in December, 1936.

Value of imports from the United States increased from $10,288,000 to $12,288,000. Machinery, the leading item, totaled $3,219,000, against $2,028,000 in December, 1936. Among the other imports from the United States were automobile parts, $2,713,000; automobiles, $1,336,000; engines and boilers, $864,000; farm implements, $845,000; plates and sheets, $755,000; miscellaneous rolling mill products, $457,000; tubes and pipes, $121,000; tools, $103,000.

Exports for December rose in value from $4,838,000 to $5,260,000, but exports to the United States declined from $573,000 to $371,000. Farm implements, the most important class, increased from $127,000 to $261,000.

RATE OF OPERATION
(Relation of Production to Capacity)

	1938[1]	1937[2]	1936[3]	1935[4]
Jan.	34.2	76.6	48.2	34.2
Feb.		79.5	46.6	41.4
March		82.5	48.5	41.0
April		83.7	59.1	40.0
May		84.3	63.1	40.2
June		76.6	63.6	37.2
July		82.9	61.5	35.2
Aug.		85.7	64.3	40.7
Sept.		83.7	66.9	42.5
Oct.		68.4	71.0	45.8
Nov.		49.3	72.3	49.5
Dec.		35.6	74.2	49.0

[1] Based on capacity of 49,727,737 gross tons, June 30, 1937; [2] first half on capacity of 49,512,737 tons, Dec. 31, 1936—second half on capacity of 49,727,737 tons, June 30, 1937; [3] capacity of 49,777,893 tons, Dec. 31, 1935; [4] capacity of 50,845,741 tons, Dec. 31, 1934. Capacities by American Iron and Steel institute.

MEN OF INDUSTRY

■ JOSEPH F. FROGGETT, senior editor, *Daily Metal Trade,* was honored Feb. 3 by 120 of his home-office associates at a luncheon, upon completion of his thirtieth year with the Penton Publishing Co., Cleveland, publishers of STEEL, *Daily Metal Trade,* and other business and industrial papers.

E. L. Shaner, president of the company, presided and Samuel H. Jasper, manager of the company's Pittsburgh office, who was similarly honored in September for 30 years' service, presented a watch as a testimonial from fellow workers.

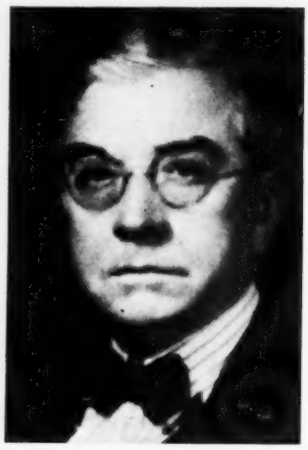
Mr. Froggett began his journalistic career in 1890 as reporter on the *Telegram* in Youngstown, O., and became managing editor of that paper. In 1906 he moved to Cleveland and was associated with the *Cleveland Plain Dealer.* He joined the Penton organization Jan. 6, 1908, as assistant to George Smart, then editor of *Iron Trade Review,* STEEL's predecessor. When the daily edition of the *Review* was started in 1909 he devoted considerable time to its editing and when this was enlarged and renamed *Daily Iron Trade Review* he was made managing editor.

In 1925 he was appointed senior editor of Penton publications, and later senior editor of *Daily Metal Trade,* successor of *Daily Iron Trade Review.* He is well known for his regular column, "Touch and Go," in which his wide knowledge of men and affairs in the iron and steel industry provides interesting sidelights suggested by day-to-day news.

♦

J. M. Sias, for 45 years associated with the United States Steel Corp. subsidiaries and in recent years assistant to the vice president in charge of operations for the United States Steel Corp. of New Jersey, has been appointed assistant vice president, raw materials department, United States Steel Corp. of Delaware. Mr. Sias began his career in the auditing department of the former Carnegie Steel Co., being transferred to the company's raw materials department six years later. He then went to the New York offices of the New Jersey corporation as assistant to the vice president, raw materials, in 1909.

J. M. Sias



J. F. Froggett

♦

H. J. McJunkin, 7800 Edgewood avenue, Swissvale, Pa., has been appointed sales representative in the Pittsburgh district for Jas. Clark Jr. Electric Co. Inc., Louisville, Ky.

♦

Vernon E. Walters, identified with the automotive industry the past 18 years, has been made factory manager, Kent-Owens Machine Co., Toledo, O.

♦

Charles B. Patt, assistant superintendent at Donora, Pa., works of American Steel & Wire Co. for over five years, has been appointed superintendent of the company's Allentown, Pa., works, succeeding the late James S. Phifer.

♦

Cecil Warrender will sail early this month for England where he will serve as superintendent of the slab and strip mills now under construction for Richard Thomas Tin Plate Co. at Ebbw Vale, Wales. He recently resigned as assistant director of the rolling mill department, Carnegie-Illinois Steel Corp., Chicago.

♦

R. J. Schuler, for 13 years associated with the sales department of LaSalle Steel Co., Chicago, since 1929 in the capacity of general manager of sales, has resigned, effective Jan. 28. Prior to joining the LaSalle organization in 1925, Mr. Schuler had been identified for several years with the Chalmers Motor Co.; was director of purchases, Detroit Gear & Machine Co. for three years; served as eastern manager of national sales, Federal Motor Truck Co. for two years; and also devoted several years to sales in the tool and machinery field. Following a vacation of several weeks in the South, Mr. Schuler will return to Detroit where he resides.

♦

Prof. Herbert M. Boylston, head of the department of metallurgy, Case School of Applied Science, Cleveland, has been granted a six-month leave of absence because of ill health, and will leave shortly for Tucson, Ariz. K. H. Donaldson, professor of mineral industry, will serve as acting head of the department.

♦

Frank L. Fay has resigned as president, Greenville Steel Car Co., Greenville, Pa., after 27 years' service. He has been succeeded by Col. Edwin Hodge Jr., of Pittsburgh. Other officers are: Vice president in charge of production, W. S. Dietrich; vice president in charge of sales, K. C. Gardner; treasurer, R. A. Zimmerman; secretary, John Bane Jr.

♦

Dr. Byron E. Eldred, consulting engineer and inventor, has been elected president, Engineers club, New York, to succeed the retiring president, A. S. Tuttle. J. F. Daggett has been elected chairman of the board, to succeed D. S. Stephenson. C. W. Guttziet will succeed Dr. Eldred as vice president, and H. A. Kidder will succeed E. S. Skillin as treasurer. J. T. Webster has been re-elected secretary.

♦

Walter H. Bruckner has been appointed research associate in metallurgical engineering, department of mining and metallurgical engineering, engineering experiment station, University of Illinois. He previous-

R. J. Schuler

W. H. Bruckner

ly was affiliated with the United States naval research laboratory, Research Corp., Crucible Steel Co. of America, and American Smelting & Refining Co. He is a member, American Institute of Mining and Metallurgical Engineers, American Society for Metals, American Electrochemical society and American Welding society.

•

George Callos has been appointed assistant manager in charge of sales promotion, embracing advertising, bulletins, exhibitions and house organs, Allis-Chalmers Mfg. Co., Milwaukee, while A. K. Birch has been named assistant manager in charge of market analysis and sales organization service, including price books, data, sales information and the distribution of literature.

•

A. V. Berthold has been named plant manager, Sweet's Steel Co., Williamsport, Pa. He formerly was assistant general superintendent, West Virginia Rail Co., Huntington, W. Va., and served two years as plant consultant with the Rail Steel Bar association, Chicago. More recently he was employed as civilian plant superintendent in the naval aircraft factory in Philadelphia.

•

L. E. Feisner has resigned as

L. E. Feisner

hot mill superintendent of Jones & Laughlin Steel Corp.'s new strip mill, Pittsburgh. He will leave soon for Russia where he will take charge of operations of both hot and cold mills in the strip mill recently built at Zaporojie for the Soviet government by United Engineering & Foundry Co., Pittsburgh.

•

A. W. Carey, traffic manager, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., since 1907, has retired under provisions of the United States Steel Corp.'s retirement plan. John Henry Schroeder, assistant traffic manager since August, 1933, has been named traffic manager.

Born in Glen Haven, N. Y., Jan. 20, 1868, Mr. Carey has served United States Steel subsidiaries more than 38 years, and with the exception of a brief period in the brokerage business, his entire career has been in the traffic field.

Mr. Schroeder's affiliation with the Steel corporation began in 1914 when he joined the American Bridge Co. He went to Birmingham in August, 1933.

•

O. F. Stroman, since 1931 manager, industrial sales department, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been appointed assistant to the vice president in charge of sales. C. B. Steinback, formerly assistant manager of the industrial sales department, succeeds Mr. Stroman. Bernard Lester, also a former assistant manager, has been made manager of a newly created resale department.

•

C. H. Palmer, first vice president and general sales manager, and Howard T. Beidler, secretary, National Screw & Mfg. Co., Cleveland, will retire this month. Mr. Palmer joined the company in 1898, while Mr. Beidler has been with the company 49 years.

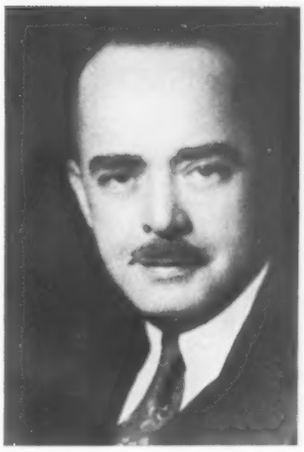
Succeeding Mr. Palmer as vice president and general sales manager is C. F. Newpher, formerly assistant to the president. E. E. Griese, treasurer, has also taken over the duties of secretary.

•

David B. Hill has been appointed sales engineer, specializing in foundry systems, for the Chain Belt Co., Milwaukee. His experience covers the design, fabrication, installation and sale of practically every type of conveyor, and he has been instrumental in the design of some of the largest foundry units in the country. Mr. Hill will be located at Chicago.

•

T. M. Girdler, chairman, Republic Steel Corp., Cleveland; C. S. Davis, president, Borg-Warner Corp., Chicago; Lammot du Pont, president, E. I. du Pont de Nemours & Co. Inc., Wilmington, Del., and H. W. Prentis Jr., president, Armstrong Cork Co., Lancaster, Pa., have been elected regional vice presidents, National Association of Manufacturers, New York.



J. H. Schroeder

As reported in STEEL, Jan. 31, page 24, Charles R. Hook, president, American Rolling Mill Co., Middletown, O., was elected president of the association. The following have been elected national vice presidents: Edgar M. Queeny, president, Monsanto Chemical Co., St. Louis; Walter J. Kohler, chairman, Kohler Co., Kohler, Wis.; S. Clay Williams, chairman, R. J. Reynolds Tobacco Co., Winston-Salem, N. C. Howard Coonley, chairman, Walworth Co. Inc., New York, is treasurer.

DIED:

■ SAMSON D. WRIGHT, 71, president, Atlas Bolt & Screw Co. and its subsidiary the Atlas Car & Mfg. Co., Cleveland, in that city, Feb. 2. Mr. Wright was one of the original organizers of the company in 1896. He was a member, American Iron and Steel institute and many other industrial and civic organizations.

•

Herbert W. Tinker, 54, mechanical

David B. Hill

engineer, Seaman Body division of Nash-Kelvinator Corp., in Milwaukee, Jan. 23.

♦

August J. Buenzli, 61, organizer, treasurer and general manager, Wisconsin Foundry & Machine Co., Madison, Wis., in that city, Jan. 31.

♦

Arthur W. Ruttan Sr., 59, president and general manager, Robinson Plating Co., Milwaukee, Jan. 30.

♦

L. A. Clark, 71, president, Samuel Harris & Co., Chicago, machinery manufacturer, in Miami, Fla., Jan. 30.

♦

George L. Lorch, 53, assistant plant superintendent and process engineer, Oliver Farm Equipment Co., Jan. 23 at Battle Creek, Mich.

♦

John Dalzell Shaner, 38, secretary, and senior member of the legal staff, Koppers Co., Pittsburgh, in Pittsburgh, Feb. 2. Mr. Shaner joined the company in 1923.

♦

Osmond D. Heavenrich, 54, former chief engineer for Detroit Pressed Steel Co., in that city, Jan. 23. Recently he had been identified with a Detroit brokerage firm.

♦

F. L. Alldis, 59, superintendent of the Chrysler Corp.'s Highland Park plant sheet metal department, and an authority on sheet metal manufacture, in Highland Park, Mich., Jan. 27.

♦

Frederick W. Hohmann, 53, secretary to J. J. Ricks, president, Union Carbide & Carbon Co., New York, in Montclair, N. J., Jan. 24. He had been associated with the company many years.

♦

E. W. Esslinger, 56, superintendent, industrial gas division, Cincinnati Gas & Electric Co., Cincinnati, in that city Jan. 21. For many years he was active in the Cincinnati chapter of the American Society for Metals.

♦

Andrew J. Lindsay, 57, vice president and treasurer, Scott-Newcomb Inc., St. Louis, manufacturer of heating and air conditioning equipment, in St. Louis, recently. He had been an officer of Scott-Newcomb since 1922.

♦

Fred F. Loomis, head of the Chicago district mill entry bureau, order division, Carnegie-Illinois Steel Corp., in Chicago, Jan. 24. He had been connected with the company for 33 years, beginning as a clerk in the order division of Illinois Steel Co.

Activities of Steel Users, Makers

■ UNITED States Steel Corp. of Delaware opened its new offices in the Koppers building, Pittsburgh, last week, and two of the four floors leased, the fourteenth and fifteenth, have been occupied. Benjamin F. Fairless, president, and his staff; Max D. Howell, vice president, secretary and treasurer; C. V. McKaig, vice president in charge of sales, and Walter Mathesius, vice president in charge of production occupy the fifteenth floor. The legal, industrial relations, and *U S Steel News* staffs are on the fourteenth floor. Engineering, purchasing and raw materials departments will be located on the thirteenth floor March 1, while the advertising, patents and research and market research departments will occupy the sixteenth floor, April 1.

♦

New York offices of the Weirton Steel Co., Great Lakes Steel Corp. and Hanna Furnace Co., have been moved from 500 Fifth avenue to 405 Lexington avenue.

♦

Himmel Brothers Co. has moved its factory and offices from 200 Commerce street, New Haven, Conn., to 1409-15 Dixwell avenue, Hamden, Conn., a suburb of New Haven.

♦

Republic Rubber division of Lee Rubber & Tire Corp., Youngstown, O., has appointed Shook & Fletcher Supply Co. Inc., Birmingham, Ala., as distributor for its heavy mechanical rubber products for industrial use, and has also named Atlanta Belting Co., Atlanta, Ga., as distributor in that territory.

♦

Washing machine tubs of Enduro stainless steel, a product of the Republic Steel Corp., Cleveland, are being fabricated by Beatty Bros. Ltd., Fergus, Ont. According to the company seven out of ten buyers request stainless steel tubs, principally because of appearance, ease of cleaning and durability.

♦

Summer & Co., Columbus, O., has purchased the Springfield-Toledo division of the Cincinnati & Lake Erie Railroad Co., which comprises approximately 145 miles of track and electrical overhead, but does not include rolling stock or real estate. It plans to start dismantling the property soon.

♦

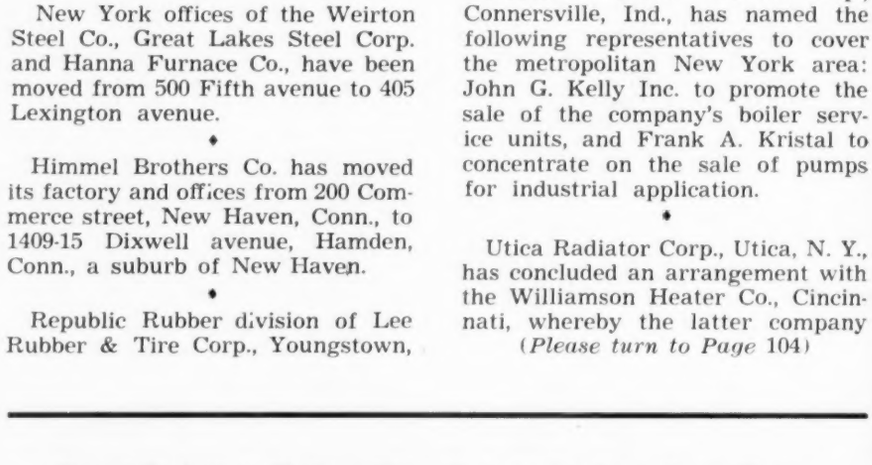
Roots-Connersville Blower Corp., Connersville, Ind., has named the following representatives to cover the metropolitan New York area: John G. Kelly Inc. to promote the sale of the company's boiler service units, and Frank A. Kristal to concentrate on the sale of pumps for industrial application.

♦

Utica Radiator Corp., Utica, N. Y., has concluded an arrangement with the Williamson Heater Co., Cincinnati, whereby the latter company

(*Please turn to Page* 104)

Steel Exhibit Takes Top Prizes at Lumber Show



■ **This exhibit of Republic Steel Corp.'s farm fence and roofing products was awarded two prizes at the recent convention of the Northwestern Lumbermen's association, Minneapolis—first prize in the building material division, and the grand sweepstakes prize for all divisions. Theme was "Republic Farm Products at Your Fingertips". This was dramatized by means of a huge model of two cupped hands, around which were placed models of products. Playing over all were waves of colored lights**

New Records in Steel Exports

■ EXPORTS of iron and steel products from the United States in 1937, excluding scrap, ranked sixth in annual volume, being exceeded only by the period 1916 to 1920, inclusive. Scrap exports established a new alltime record, according to statistics of the metals and minerals division, department of commerce.

Exports, aside from scrap, totaled 3,471,990 gross tons, valued at $222,678,977, compared with 1,221,209 tons, valued at $88,000,555, in 1936, an increase of 184 per cent in volume and 153 per cent in value. Compared to the 1929 total of 2,480,813 tons, valued at $192,706,661, the increase is 40 per cent in volume and 16 per cent in value.

Export trade in 1937 presented a number of other important features. These include the highest volume of pig iron shipments ever recorded; new annual tin plate record; steel ingot shipments largest since 1918; recovery of rail exports to highest point since 1928; strong sheet shipments; substantial gains in pipe exports; plate shipments approximating 1917 level; average composite price per ton of 12 leading products, $71.69, showing a gain of $11.40 over 1936 and 77 cents over 1929.

Pig iron represented the highest individual tonnage, other than scrap, 782,436 tons comparing with 5316 tons in 1936 and 46,357 tons in 1929. Steel plate exports amounted to 412,048 tons; tin plate, 354,339 tons; ingots and blooms, 335,442 tons; black sheets, 286,223 tons; pipe and fittings, 180,002 tons.

Except for riveted iron and steel pipe, every iron and steel product shipped from the United States in 1937 registered a gain over 1936.

Scrap exports totaled 4,095,894 tons, valued at $79,576,542, compared with 1,936,132 tons in 1936, an alltime record. A feature of the 1937 scrap trade was that European purchases, 1,861,701 tons, closely approximated those of the Far East, 1,955,997 tons.

December imports of steel and iron products totaled 25,104 tons, valued at $1,568,033, exclusive of scrap, an increase of 5 per cent over November.

For 1937 imports totaled 451,520 tons, valued at $24,495,791, compared with 524,483 tons, valued at $21,908,693 in 1936. This is a decline of 14 per cent in volume but an increase of 12 per cent in value.

Export tonnages and values for December were presented in STEEL, Jan. 31, page 18.

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

	1937 Imports	1937 Exports	1936 Imports	1936 Exports
Jan.	43,063	201,692	50,489	241,564
Feb.	41,628	290,987	43,358	213,802
March	51,805	570,584	56,720	264,337
April	68,197	683,674	49,277	301,987
May	49,050	969,222	59,391	314,950
June	44,771	826,534	59,910	294,951
July	47,012	889,438	47,490	296,738
Aug.	61,489	836,319	60,697	295,341
Sept.	37,071	543,740	59,993	235,784
Oct.	37,186	522,611	64,509	261,882
Nov.	26,996	556,591	61,970	203,297
Dec.	25,792	626,418	52,584	244,156
Total	533,160	7,567,884	666,838	3,162,694

ORIGIN OF DECEMBER IMPORTS

Gross Tons

	Iron ore	Pig iron	Manganese ore	Ferromanganese
Norway	21,203	.....	.....	399
Sweden	7,031	.....	.....	.....
Cuba	22,000	.....	5,306	.....
Chile	119,685	.....	.....	.....
Australia	11,502	.....	.....	.....
Netherlands	.....	2,502	.....	.....
Canada	.....	166	.....	.....
British India	.....	6,460	523	.....
Soviet Russia	.....	.....	18,064	.....
Gold Coast	.....	.....	14,022	.....
Total	181,421	9,128	37,915	399

	Sheets, skelp and sawplate	Structural steel	Steel bars	Hoops and bands
United Kingdom	2	.....	67	.....
Belgium	243	2,987	1,728	1,643
France	10	310	58	163
Sweden	3	.....	481	1
Germany	.....	99	111	71
Austria	.....	.....	12	.....
Czechoslovakia	.....	.....	5	.....
Total	258	3,396	2,462	1,878

UNITED STATES IMPORTS FOR CONSUMPTION OF IRON AND STEEL PRODUCTS

Gross Tons

Articles	Dec. 1937	Nov. 1937	Jan. thru Dec. '37
Pig iron	9,128	6,661	111,697
Sponge iron	237	101	1,872
Ferromanganese*	399	350	23,965
Spiegeleisen	341	438	17,895
Ferrochrome†	.....	.....	260
Ferrosilicon‡	57	138	2,924
Other ferroalloys§	.....	.....	52
Steel ingots, blooms	.....	.....	130
Billets	223	33	2,077
Concrete reinf. bars	85	43	3,894
Hollow bar, drill steel	191	188	2,538
Bars, solid or hollow	2,462	1,811	44,191
Iron slabs	.....	.....	1
Iron bars	93	123	1,959
Wire rods	634	1,405	15,818
Boiler, other plate	.....	1	214
Sheets, skelp, saw plate	258	57	8,800
Die blocks or blanks	1	3	102
Tin plate, taggers' tin and terne plate	15	27	248
Structural shapes	3,396	3,968	76,013
Sashes, frames**	.....	.....	.....
Sheet piling	99	.....	2,260
Rails and fastenings	166	320	8,299
Cast-iron pipe, fittings	39	514	3,282
Mall'ble iron pipe ftgs.	.....	12	416
Welded pipe	748	713	9,540
Other pipe	2,136	2,082	32,947
Cotton ties	.....	.....	454
Other hoops, bands	1,878	1,582	26,697
Barbed wire	589	1,446	16,664
Round iron, steel wire	484	250	4,865
Teleg., telephone wire	17	.....	34
Flat wire and strips	262	669	4,033
Wire rope and strand	232	188	3,547
Other wire	65	97	3,247
Nails, tacks, staples	432	552	15,031
Bolts, nuts, rivets	9	16	571
Horse and mule shoes	...	18	397
Castings and forgings	428	179	4,586
Total gross tons	25,104	23,985	451,520
Iron and steel scrap	688	3,011	81,640
GRAND TOTAL	25,792	26,996	533,160

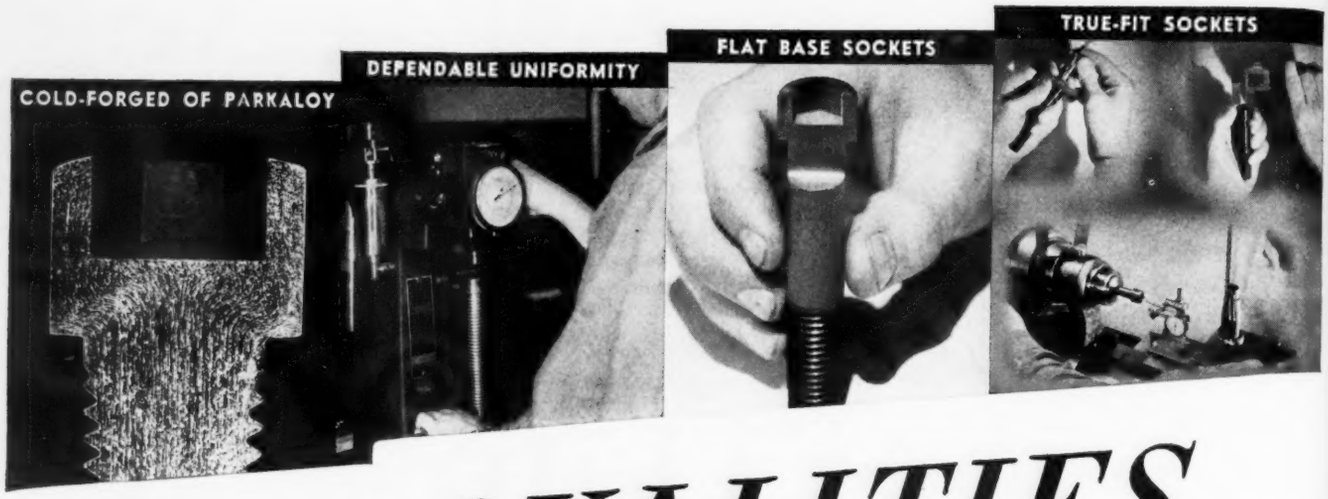
*Manganese content; †chrome content; ‡silicon content; §alloy content; **formerly included with "Structural shapes".

UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Articles	Dec. 1937	Nov. 1937	Jan. thru Dec. '37
Pig iron	36,545	26,225	782,436
Ferromanganese and spiegeleisen	39	57	1,725
Other ferroalloys	362	80	2,780
*Ingots, blooms, etc.:			
Not containing alloy	64,183	36,064	328,228
Alloy incl. stainless	53	167	7,214
Bars, iron	65	155	2,221
Bars, concrete	2,280	1,215	17,900
*Other steel bars:			
Not containing alloy	15,168	15,595	132,485
Stainless steel	29	4	222
Alloy not stainless	585	482	6,399
Wire rods	2,811	6,445	60,006
Boiler plate	790	1,431	10,449
*Other plates, not fab.:			
Not containing alloy	21,412	31,486	371,172
Stainless steel	10	.....	153
Alloy not stainless	64	2,584	5,052
Skelp iron or steel	624	1,965	76,478
Sheets, galv. iron	752	483	5,552
Sheets, galv. steel	5,863	6,680	75,446
*Sheets, "black" steel:			
Not containing alloy	20,749	25,814	279,737
Stainless steel	298	406	1,751
Alloy not stainless	81	30	4,735
Sheets, black iron	397	596	10,805
*Strip steel, cold-rolled:			
Not containing alloy	4,537	3,327	35,136
Stainless steel	52	65	548
Alloy not stainless	42	61	622
*Strip steel, hot-rolled			
Not containing alloy	3,818	3,650	74,295
Stainless steel	3	1	120
Alloy not stainless	1	1	517
Tin plate, taggers' tin	31,364	52,795	354,339
Terne plate	517	212	5,153
Tanks, except lined	12,547	3,099	44,611
Shapes not fabricated	8,060	9,689	135,703
Shapes, fabricated	3,664	4,830	39,074
Plates, fabricated	3,335	407	25,222
Metal lath	70	81	1,803
Frames and sashes	78	228	1,715
Sheet piling	657	378	7,441
Rails, 60 lbs.	27,598	22,615	110,639
Rails, under 60 lbs.	263	497	10,126
†Rails, relaying	735	3,363	27,417
Rail fastenings	1,748	3,440	14,582
Switches, frogs, etc.	353	168	2,493
Railroad spikes	167	159	3,002
R.R. bolts, nuts, etc.	73	48	1,112
Boiler tubes, seamless	1,027	3,438	16,796
Boiler tubes, welded	45	1	684
Pipe:			
Seamless casing and oil-line	6,719	7,497	75,027
Do. welded	484	60	7,203
Smls. black, ex.csg.	854	592	12,482
Pipe fittings:			
Mall. iron screwed	266	724	5,383
Cast-iron screwed	138	170	2,965
Pipe and fittings for:			
Cast-iron pressure	1,302	1,125	20,612
Cast-iron soil	938	711	7,671
Pipe, welded:			
Black steel	1,330	1,962	21,445
Black wrought-iron	1,444	109	5,673
Galvanized steel	1,570	855	18,372
Galv. wrought iron	244	128	2,189
Pipe and fittings:			
Riveted iron or steel	193	255	980
Wire:			
Plain iron or steel	1,801	2,230	33,141
Galvanized	1,382	1,002	23,046
Barbed	1,726	1,717	33,831
Woven wire fencing	261	90	3,160
*Woven wire screen cloth:			
Insect	17	8	548
Other	89	58	1,042
‡Wire rope	529	358	6,538
‡Wire strand	91	61	1,285
†Card clothing	1	2	48
Other wire	520	475	8,685
Wire nails	1,678	685	17,407
Horseshoe nails	103	105	974
Tacks	33	46	408
Other nails, staples	327	187	3,099
Bolts, etc.	744	779	11,165
Castings:			
*Gray iron, semi-steel	208	224	5,317
Malleable iron	253	160	4,263
*Steel, not alloy	223	106	2,249
Alloy incl. stainless	144	68	1,647
Car whls., tires, axles	6,351	7,382	27,777
Horseshoes and calks	5	2	180
*Forgings, n.e.s.:			
Not containing alloy	646	797	9,149
Alloy incl. stainless	119	33	933
Total (gross tons)	306,647	301,280	3,471,990
Scrap, iron and steel	319,016	254,072	4,039,143
Scrap, tin plate	382	716	14,188
†Tin plate circles, strips, cobbles, etc.	222	58	13,000
Waste-waste tin plate	151	465	29,563
Total scrap	319,771	255,311	4,095,894
GRAND TOTAL	626,418	556,591	7,567,884
Iron ore	166	36,557	1,266,571

*No comparisons available; †new class; ‡no distinction prior to 1936.



These QUALITIES...

..have quickly won WIDE ACCEPTANCE *for Parker-Kalon Socket Screws!*

In the short span of six months Parker-Kalon *Cold-forged* Socket Screws have gained nationwide acceptance. It could not be otherwise. The reason is that they are more than a 'good' product. Two years of research and development... most modern production facilities... a laboratory, without counterpart in the industry, for controlling and maintaining the essential characteristics in Screws of this type... have been combined to produce a product of *unusual* quality.

If you demand precision... uniform strength... appearance ...in the Socket Screws you use—send for free samples. See for yourself how highly these important factors have been developed in Parker-Kalon *Cold-forged* Socket Screws.

PARKER-KALON CORPORATION
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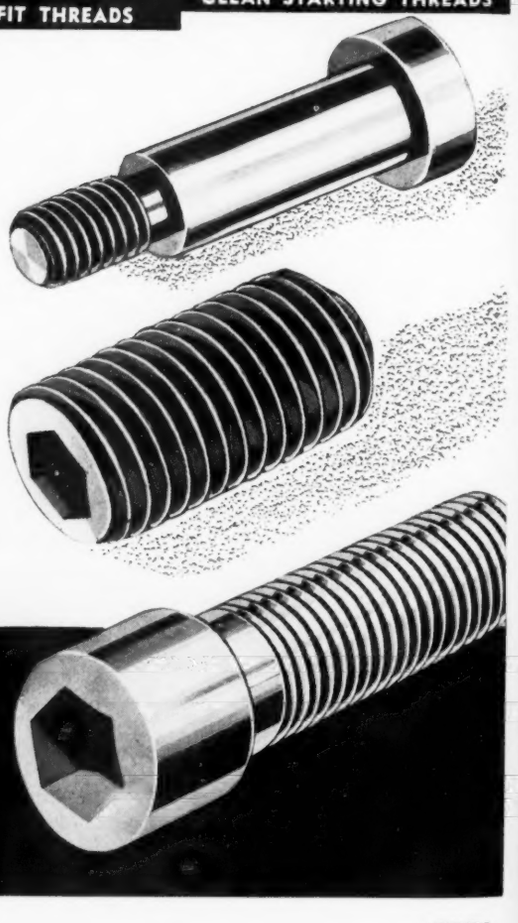
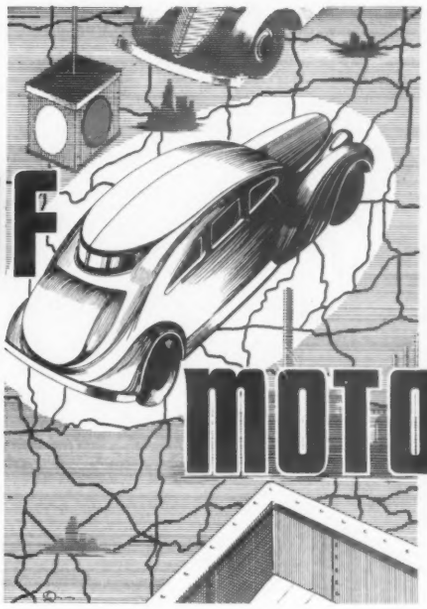


PARKER-KALON
Cold-forged
SOCKET SCREWS

MIRRORS OF MOTORDOM



DETROIT

■ WHAT is wrong with American industry? That is the question of the hour, whether you are speaking of automobiles, lawnmowers, refrigerators or needles and pins.

As far as automobiles are concerned, the answer is pretty well tied up in the used car jam. There are scattered signs of a break in this field, but other than conversationally, no drastic steps are being taken to correct the situation. Conferences at Washington between the President and leaders of the auto industry showed empty results, about the only significant statement being the remark of Mr. Knudsen in connection with a query as to how he would regard a proposal for the government and the industry to join hands to buy up old cars for junking, each contributing $20.

"Forty dollars a ton is a pretty high price for scrap iron," Mr. Knudsen is reported to have said.

Roosevelt Did the Talking

Perhaps one reason for the failure of these conferences to arrive at any definite conclusions is that the President did all the talking, while the auto executives did a first-class job of listening.

Now the representatives of smaller industries have gone to Washington to see what they can make out of the present state of things.

Attitude of most of these interests is summed up in the words of Walter L. Fry of the Fry Products Corp. who said, as he climbed aboard a train, "I have far too much respect for the office of President of the United States to tell the President to 'stop talking,' so I should content myself with politely asking Mr. Roosevelt, as the chief offender, and Mr. Ickes, Miss Perkins and Mr. Jackson, to refrain from making any further speeches for six months concerning what the New Deal intends to do to industry.

BY A. H. ALLEN
Detroit Editor, STEEL

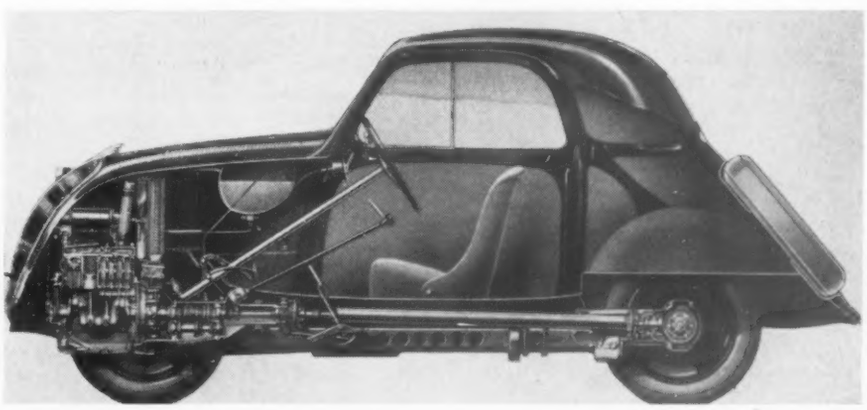
Then industry will quickly regain confidence and dig not only Mr. Roosevelt out of the hole but the nation as well."

The tip is being passed around here to watch for the first of the series of articles on what ails industry, to appear in the April issue of a national magazine. The articles will be based on results of a survey now being quietly made of the business, political and social aspects of the present recession, and according to advance reports will be salty reading.

In determining what is wrong with industry, two recent case histories may be helpful: One concerns a medium-size company which manufactures lawnmowers of the gasoline-powered type used extensively on large estates and golf courses. Failure of buying to materialize this year led to the development of a street sweeper, using the same mechanism but substituting a rotary brush for the cutter bar of the lawnmower. The sweeper looked promising for municipal street cleaning departments and several cities evinced interest in buying the equipment. But this business has failed to materialize and most cities are now in process of retrenching on expenditures for equipment. Hence, this manufacturer is not buying steel, has only a skeleton force at work and is at a loss to know what to do next.

Case No. 2 is another small manufacturing company outside Detroit which sells spraying equipment for farmers. Normally this company does 60 per cent of its year's busi-

Bantam Italian Car Bids for American Business



■ **Cross section through the Italian-built Fiat 500 model, mentioned in this department Nov. 22, shows the unique position of reversed engine ahead of front axle, with radiator at rear of engine. This arrangement permits added room for passengers and luggage, wheelbase being only 78¾ inches. Importers are taking delivery of about 250 of these cars monthly for the American market**

ness in April, since farmers must buy this equipment early. With one month of the present year gone, not a dollar's worth of business has been booked for April shipment. Why? Farmers are reported to have money to spend for equipment, but there is general apprehension over whether they should spend their cash or not, many believing it wiser to keep funds in the bank. Noting this condition, jobbers decide against stocking supplies for spring purchases, and the manufacturer must scale down when he cannot move his product to jobbers. The manufacturer's steel supplier thus receives an order for 500 pounds of steel instead of the expected 50,000 pounds.

Other suppliers report plenty of orders, but no releases. And on top of it all, a good many buyers have closed their desks and left for Florida to think over their problems in a warmer climate.

Speaking of Florida, recent arrivals included a busload of foremen from one of the Chrysler plants here. Taking advantage of a plant shutdown from Jan. 25 to Feb. 8, these men chipped in and chartered a bus for the journey south, returning to their posts this week.

■ FIRST step in livening up the appearance of the Ford standard line is the application of light-gage stainless steel snap-on strips of molding to the belt line and radiator grille. These strips, which make a surprising change in the appearance of the car, are provided with spring clips which can be snapped through holes drilled in the body and held firmly in place. All standard models now being assembled are so equipped, and the extra trim can be supplied to any owner of a standard model who insists on it. About 40,000 of the models have been shipped without the stainless molding, which averages about 1 pound per car.

Considerable consternation developed among Ford sales and advertising people when Mr. Ford himself expressed disbelief in the 24 miles per gallon showing of Lincoln Zephyr in the Gilmore-Yosemite economy run. Despite assurance that such was the showing made, Mr. Ford still refused to believe that the normal 14-17 miles per gallon figure had been bettered so sharply. After several calls had been put through to a West Coast distributor, it developed the car had been driven with a Columbia overdrive rear axle. Upon being informed, Mr. Ford insisted any advertising in which the higher figure was used explain clearly that an overdrive was used. This was done.

Although Ford employment is considerably below the normal level of 85,000, still it is said that those now working at least give a full 8 hours work for 8 hours pay each day, compared with an estimated equivalent of 3 to 4 hours work for 8 hours pay being experienced in some other automotive plants where the UAW has dominated the labor picture.

Additional releases were being received last week from Packard on steel and parts, indicating possibly an upward movement of assemblies there, which have been averaging about 1200 cars weekly, practically all sixes and eights. Packard engineers are working on refinements of the present 8-cylinder engine for 1939 models. This engine, incidentally, is understood to be quite similar to the 8-cylinder power plants used by Olds and Pontiac, the same engineer having been active in development work on all three.

Automobile Production

Passenger Cars and Trucks—United States and Canada

By Department of Commerce

	1936	1937	1938
Jan.	377,244	399,634	*250,000
Feb.	300,810	383,698	.....
March	438,943	519,177	.....
April	527,625	553,415	.....
May	480,518	540,357	.....
June	469,368	521,139	.....
July	451,206	456,909	.....
Aug.	275,934	405,064	.....
Sept.	139,820	175,620	.....
Oct.	230,049	337,979	.....
Nov.	405,799	376,637	.....
Dec.	518,958	346,886	.....
Year	4,616,274	5,016,565	.....

*Preliminary.

Week ended	
Jan. 8	54,084
Jan. 15	65,735
Jan. 22	65,418
Jan. 29	59,365
Feb. 5	51,443

	Week ended Feb. 5	Jan. 29
General Motors	21,230	21,475
Chrysler	2,950	5,950
Ford	20,700	22,765
All Others	6,563	9,175

■ NASH executives are reported to have given the go-ahead signal on the small $400 car mentioned here last week, designs for which have been completed. Attempting to forecast how soon the car will be ready for the public is a difficult task, since if any complicated new dies are needed, it will require a minimum of four months for machining them, testing and getting them in production. Putting extra pressure on die sources usually does not pay, since they are restricted in the amount of overtime work they can do, and rushing a large die job only adds to the possibility of errors in construction.

The Nash line for 1939 will bear a resemblance to the Lincoln Zephyr line this year. More than one automotive stylist will tell you the Zephyr motif represents the trend in design which will be followed in the next few years. However, advance reports of body design conferences held by General Motors indicate a preference for the lines of the Cadillac 60 series as a forerunner of the future.

In the past two weeks about 2000 men have been recalled to the Willys plant in Toledo, and assemblies may be started this week. The company is said to be considering the addition of a two-door sedan model to the present lineup.

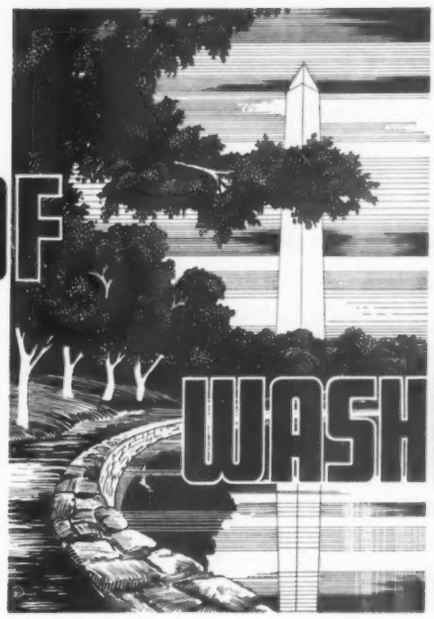
■ RECALLING widespread publicity resulting from their 1937 mass meeting and "show of strength" parade, leaders of the UAW decided to repeat the assemblage, and Friday Cadillac square in downtown Detroit was jammed again with automobile workers, many of them now unemployed, while officers of the UAW addressed them in the hope their pleas would be heard as far away as Washington. Reason for the convocation was to protest layoffs in automobile plants and to warn of impending "mass starvation in Michigan."

These same vociferous leaders probably took little time to reflect on the fact that their own abortive efforts of a year ago to jack up wage levels in the industry were partly responsible for the plight of thousands now out of jobs.

City officials at first were going to refuse to sanction the mass meeting, but when they discovered notices had been distributed to participants, they realized such refusal would be futile, and in the end would only foster trouble. Police stenographers stood by to take down every word spoken by union leaders. Earlier in the day, unemployed union men in Pontiac staged a parade of their own, followed by a "demonstration" in front of the Oakland county courthouse in protest of "welfare, housing and medical conditions."

Seeds of a new national labor organization—the National Federation of Labor—were sown in Detroit recently under the sponsorship of the Society of Tool and Die Craftsmen, an organization of 3500 which has contracts with 23 jobbing shops here. J. J. Griffin, president of the STDC, said ten other independent unions have joined the national federation, and 68 other independents were considered prospects. CIO and AFL officials passed off the announcement as of trivial importance.

WINDOWS OF WASHINGTON



WASHINGTON

■ THERE is a great deal of speculation in Washington as to the net result of the industrial conferences the President has been holding for the past several weeks.

Those who are among the most interested indicate that they are hopeful that good will develop and others equally well informed have their tongue in their cheek and feel that it will come to nothing.

Industrialists who have come out of the conferences with the President have expressed confidence that some good will come but their statements have been too much alike to be sincere. It is natural at this stage that business men will not say anything that will upset the apple cart. Most of those who have talked to the Washington newsmen when they have emerged from these conferences have made pretty much cut-and-dried statements as though they might have been rehearsed before they even went into the executive offices. Many versions of the conferences have been published by many columnists from time to time but no one of these seems to fit in with the others. At any rate up to now there have been no definite results.

WOULD STOP WAR PROFIT; PAY COST BY TAXATION

Now that President Roosevelt has definitely spoken to the country and especially to congress, asking a bill to take the profits out of war, the bill sponsored by Senator Connally, Texas, is coming in for considerable comment. It has already been reported out by the senate finance committee.

The objectives of the Connally bill are to take excess profits out of war by imposition of high surtaxes on both individual and corporation incomes; also, to pay for a war out of current tax income, thereby removing most of the need for borrowing. The bill also provides for a specific check and balance upon a highly trained and highly equipped army and navy. The legislation would also give notice to the world that the United States is able to finance a war out of current revenues and continue it indefinitely.

BY L. M. LAMM
Washington Editor, STEEL

The report of the senate finance committee takes care not to remove the incentive of business and industry to co-operate wholeheartedly with the prosecution of a war. In this connection, Senator Connally emphasized the means proposed to retain individual incentive, and yet recapture war profits in such a way that the law would be, first, a deterrent to war, and second, a scheme to finance war out of current revenues if the nation were forced to fight.

In discussing his bill, Senator Connally recently said that "some of the matters included in the bill consist of provisions relating to (1) carry-over government contracts, (2) loss in inventory by virtue of price declines due to war cessation, (3) depletion allowances, (4) amortization of war facilities, (5) tax determination in first return under the existing peace time revenue act, as well as the contemplated war revenue act, and (6) filing of bond incident to appeal."

POWERS OF LABOR BOARD CLEARED BY DECISION

The national labor relations board won a victory in the United States Supreme Court last week when the latter ruled that a federal court in Massachusetts exceeded its authority in issuing an injunction to prevent the board from investigating charges of unfair labor practices by the Bethlehem Shipbuilding Corp. A similar ruling was issued in the case involving the Newport News Shipbuilding & Drydock Co.

The effect of the decisions is that the board is given broad powers to conduct hearings on charges of unfair labor practices, denying the employer any relief in the federal courts until after the board has made its findings. It is specifically stated in the opinion, however, that the board cannot enforce its findings, but if either side to the controversy refuses to obey the board's order, this will have to be enforced through the courts.

The feeling in Washington was definitely that these new decisions are of great importance to both the labor board and to employers.

STEEL FOR PWA PROJECTS NEARLY HALF BILLION

The bureau of labor statistics of the department of labor has announced that iron and steel products to the extent of some $465,552,000 worth were purchased from industrial concerns to supply PWA projects during the four years from June, 1933, to June, 1937. A breakdown of material orders originating with PWA projects showed purchase of a variety of iron and steel products.

By far the largest item was structural and reinforcing steel, $172,096,000 being spent for this commodity. For general steel works and rolling mill products not otherwise classified, a total of $92,254,000 was spent. The third largest purchase was cast-iron pipe, which was ordered in the amount of $50,659,000.

A complete table showing the breakdown of iron and steel products for that time is as follows: Iron and steel and their products, not including machinery, $465,552,000; bolts, nuts, washers, etc., $5,256,000; cast-iron pipe and fittings, $50,659,000; doors, shutters, window sash and frames, molding, and trim (metal), $18,589,000; forgings, iron

and steel, $7,447,000; nails and spikes, $2,280,000; rail fastenings, excluding spikes, $6,747,000; rails, steel, $22,864,000; springs, steel, $629,000; steel-works and rolling-mill products, not elsewhere classified, $92,254,000; structural and reinforcing steel, $172,096,000; switches, railway, $1,000,000; tools, other than machine tools, $3,072,000; wire products, not elsewhere classified, $9,273,000; wrought pipe, $10,261,000.

ANTI-TRUST ACTION MAY BE TAKEN UP SOON

At a recent White House press conference the President was asked if he had given up his idea of a special message to congress on the monopoly question. He said that he had not, but the indications were at that time that he was not yet ready to go into this matter, especially because he is still having his industrial conferences.

That the issue has not been forgotten is seen by the fact that last week the President had Senator Borah, Idaho, to luncheon to discuss it. The senior senator from Idaho has for many years been an anti-monopoly advocate.

The proponents of an anti-monopoly bill requiring federal licensing of corporations expressed much interest at the White House visit by Senator Borah. The latter helped draw the licensing measure, now called the O'Mahoney bill, and whhich has been pending in the senate for some time.

The indications now are that the President, having his re-armament message out of the way, will start work on his anti-trust message. He has already conferred with the recently nominated Robert H. Jackson, assistant attorney general, and with a number of other officials who are interested in the anti-trust question.

TRYING NEW POLICY IN FOREIGN TRADE RELATIONS

The state department has apparently established an entirely new policy in connection with trade between countries through the establishment by the governments of the United States and Brazil of two mixed committees of private trade interests to observe the course of trade between the two countries, as affected by the trade agreement.

These committees have grown out of discussions in Washington in July, 1937, with reference to trade relations between these countries. The joint statement issued July 15, 1937, by the secretary of state and the minister of finance of Brazil summarizes this part of the discussion as follows:

"The high convenience was furthermore recognized of the creation of two joint Brazilian-American committees composed of representatives of the trade interests of the two countries. One will be established in Rio de Janeiro, and the other in New York or Washington, with the purpose of studying the best means indicated for developing trade between Brazil and the United States, and of securing, within the commitments mutually entered into by the government of Brazil and the government of the United States in the commercial agreement of February 2, 1935, the most appropriate solutions in order to overcome the obstacles which might hinder the natural development of trade between the two countries.

"These two joint committees will have independent standing, and the obligation of reporting to the two governments. They will be guided entirely by the wish to foster trade between the two countries. The two governments are convinced that this innovation in commercial arrangements between the two countries, suggested by the president of Brazil, will provide the basis of experience useful to them both."

The two committees are, as indicated above, private bodies entirely independent of their governments. Through these committees there is established an organization representative of commercial interests with the specific purpose of observing trade relations and of reporting their observations and suggestions to the two governments.

Australia Back in Favor

The President has restored Australia to the group of nations whose products are accorded most favored nation treatment in the matter of tariff rates made by the United States under authority of the trade agreements act.

It will be recalled that the government of Australia in May, 1936, undertook a form of import restriction which resulted in discriminations against United States commerce, and diversion of imports to other sources. This made necessary the Presidential action which followed in June, when the secretary of the treasury was instructed to discontinue Aug. 1, 1936, the application to Australian products of the lowered rates made in United States trade agreements.

SAYS TRADE AGREEMENTS AID INDUSTRIAL GROWTH

Representative Daly, Pennsylvania, made a talk last week on the floor of the house in connection with trade agreements being negotiated by the state department.

He discussed advantages being obtained by the United States in the various tariff schedules. He said that "among important groups of commodities thus benefited are iron and steel semi-manufactures, automotive products, electrical apparatus, industrial and agricultural machinery." He said also that certain concessions had been obtained on the products of steel rolling mills and steel fabricating plants, notably in the Canadian, Cuban and French agreements. He said concessions on standard and specialized machine equipment and tools have been obtained in all but two of the agreements thus far concluded.

"Reductions in our tariff rates," he said, "as well as bindings either on the free list or at existent rates of duty are granted only after detailed study and weighing of the probable effects upon domestic producers and the probable benefits to consumers. Proportionately, most concessions granted by the United States have been on industrial items."

There are definite indications, he told the house, that the trade agreements program is helping to promote mutually beneficial trade between the United States and other countries, and that such trade is beginning to move more easily in response to the reductions being made in trade barriers and to the removal of discriminations.

WAS JACKSON PROMOTED OR PUT OUT OF WAY?

Washington wiseacres are doing much guessing in connection with the President's nomination of Robert H. Jackson to be solicitor general of the department of justice in place of Stanley F. Reed, who was recently appointed to the United States Supreme Court. The guessing is whether the President has kicked Mr. Jackson upstairs. There is a great difference of opinion on this point. On the one hand it is contended that this is a considerable promotion and that it will make him more eligible for nomination as governor of New York if he cares to try for that at the proper time. On the other hand, Washington observers feel that Jackson made himself so obnoxious to business interests during his recent speeches that the President has taken him away from his job as assistant attorney general in charge of trust cases.

THINK WAGE-HOUR BILL WILL PASS HOUSE SOON

In spite of the fact that the house committee on labor has definitely discontinued talk of the wage-hour bill for the present, labor's so-called non-partisan league is beating the drums in an effort to create sentiment in favor of this bill. The non-partisan league says, in effect, that enactment of a new wage-hour bill at this session of congress "now seems assured".

In a statement issued last week the league says that "house members are now confident that once the bill is again brought on the floor there will be sufficient votes to pass it".

Wage Situation May Be Crux of Effort To Bring About Increased Volume of Sales

■ RECENT expressions that existing unit wage rates must be kept up should not prevent employers from following policies which they deem wise in meeting present conditions. The same attitude in the early days of the 1929 depression served merely to cause industry to defer needed reductions.

The present depression was heralded early last year by many economists who believed that the sharply increased wage rates then becoming effective, and the resulting higher manufacturing costs, would bring prices to levels beyond the ability of the public to pay. This is exactly what has happened.

Slow Period Is Acceptable Time To Prepare for Better Demand

Nobody will deny that the common need today is for more business. More business means more production, more jobs, more real wages and more profits. Nobody will deny that the present buyers' strike is due to two reasons, lack of confidence and inability to pay existing prices.

Admitting that present tax, labor and other laws, and administration policies in general, are the primary cause of the present lack of confidence, industry can do a good deal to improve the general morale. Many companies have announced expansion and improvement programs which will bring much business and employment. Their example can be followed by other companies which require modernization to prepare for future needs and future opportunities. That the time of depression is the best time in which to prepare for prosperity still is sound logic.

Industry also can do something about the second factor, the inability of the public to pay present prices. It can proceed as far as practicable in reducing selling prices to levels at which buyers can take hold. This does not mean, necessarily, revolutionary cuts. It means reasonable reductions which will prove attractive to more buyers. As has been the case in all previous depressions, an improvement in buying soon develops a "snowball" trend which leads to prosperity.

Industry's problem embraces the measures which are necessary to reduce prices. At a time when profits in general are nonexistent, it cannot be assumed that unit wage rates are sacred. After all, the need is for more sales, for greater volume which automatically brings more jobs and greater real wages. This is a matter in which employes are just as vitally concerned as employers. That employes are willing to accept lower wages, if convinced that it is to their interest to do so, appears reasonable. Faced with the alternative of accepting reduced wages or seeing their jobs go elsewhere, employes of Gar Wood Industries Inc., Detroit, for example, voted to accept cuts ranging from 5 to 20 per cent.

Conference With Workers May Bring Policies Yielding Good to All

The above is not meant to infer that unit wages in general should be reduced. It does mean that manufacturers, if they feel wage reductions will promote business and hasten recovery, should feel free to take up the matter with their employes in order to develop policies which will prove mutually advantageous.

The workers are interested not so much in the amount they are receiving per hour as in the total compensation in their weekly pay envelops. Intelligent deliberations as to wage rates, followed by quick action, might give powerful impetus to the present slight improvement in business.

THE BUSINESS

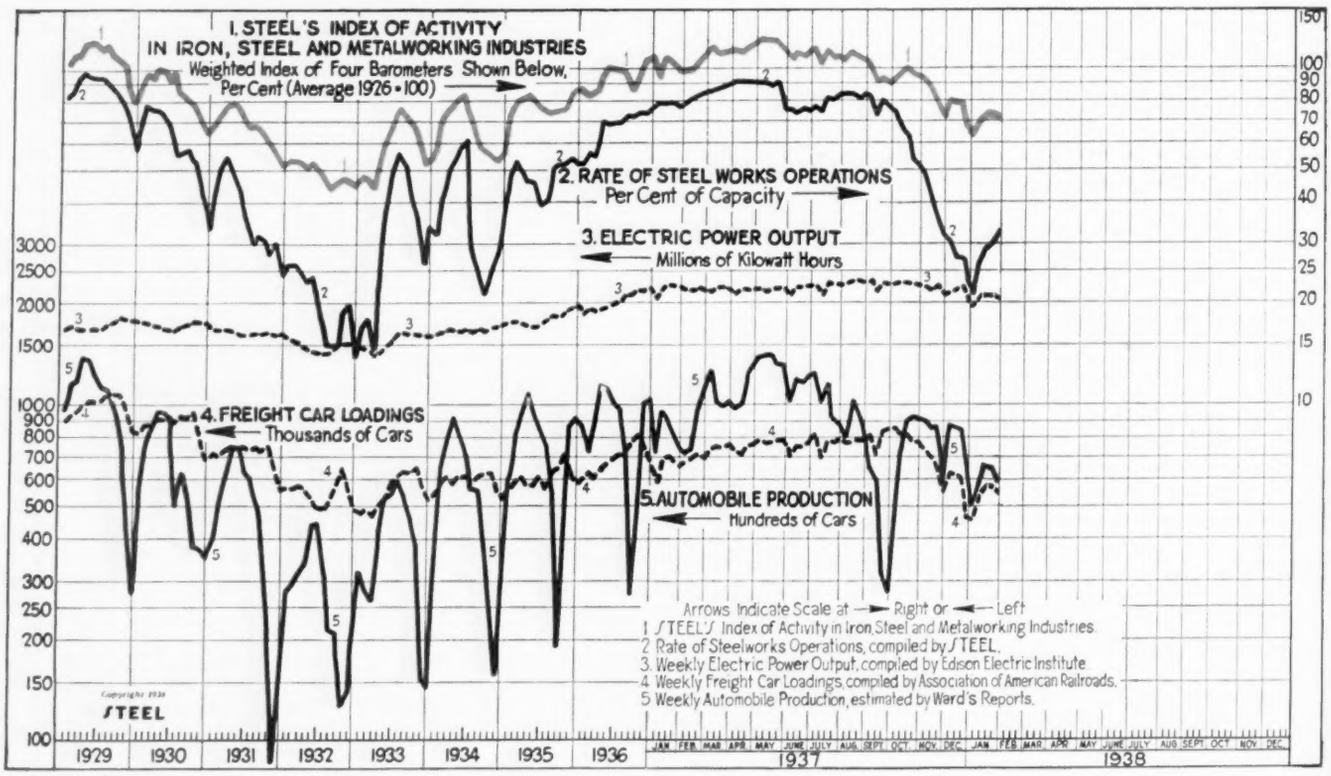
Rate of Industrial Activity Is Marking Time

■ INDUSTRIAL activity is struggling valiantly to hold its own against adverse forces, which are partly psychological. As measured by STEEL's index, activity had advanced from a low of 62.7 at the year-end to 74.7 in the week ending Jan. 22. This climb had been accomplished by slow, steady and laborious gains through most of the first month.

Now, at the beginning of February, it is apparent that the force of favorable factors has thus far been insufficient to provide a momentum for recovery. In fact, STEEL's Index for the week ending Jan. 29 stands at 73.7, a loss of one point from the preceding week.

This reflects disappointing reports for three out of four of the business indicators from which the index is derived. Revenue freight car loadings suffered a moderate relapse, after advances for three consecutive weeks. Electric power output, slipped slightly. Automobile output, which had held around 65,000 for two weeks, fell back to 59,365 units. The rate of steelworks operations—the only indicator to show a gain—stood at 33 per cent of capacity as compared with 30.5 in the preceding week.

In short activity is marking time, awaiting new impulses before developing a positive trend.


1. STEEL'S INDEX OF ACTIVITY
IN IRON, STEEL AND METALWORKING INDUSTRIES
Weighted Index of Four Barometers Shown Below,
Per Cent (Average 1926 • 100)
2. RATE OF STEEL WORKS OPERATIONS
Per Cent of Capacity
3. ELECTRIC POWER OUTPUT
Millions of Kilowatt Hours
4. FREIGHT CAR LOADINGS
Thousands of Cars
5. AUTOMOBILE PRODUCTION
Hundreds of Cars
Arrows Indicate Scale at ► Right or ◄ Left
1 STEEL'S Index of Activity in Iron, Steel and Metalworking Industries.
2 Rate of Steelworks Operations, compiled by STEEL.
3 Weekly Electric Power Output, compiled by Edison Electric Institute.
4 Weekly Freight Car Loadings, compiled by Association of American Railroads.
5 Weekly Automobile Production, estimated by Ward's Reports.
Copyright 1938 STEEL
1929 1930 1931 1932 1933 1934 1935 1936
1937
1938

STEEL'S index of activity declined 1.0 points to 73.7 in the week ending Jan. 29:

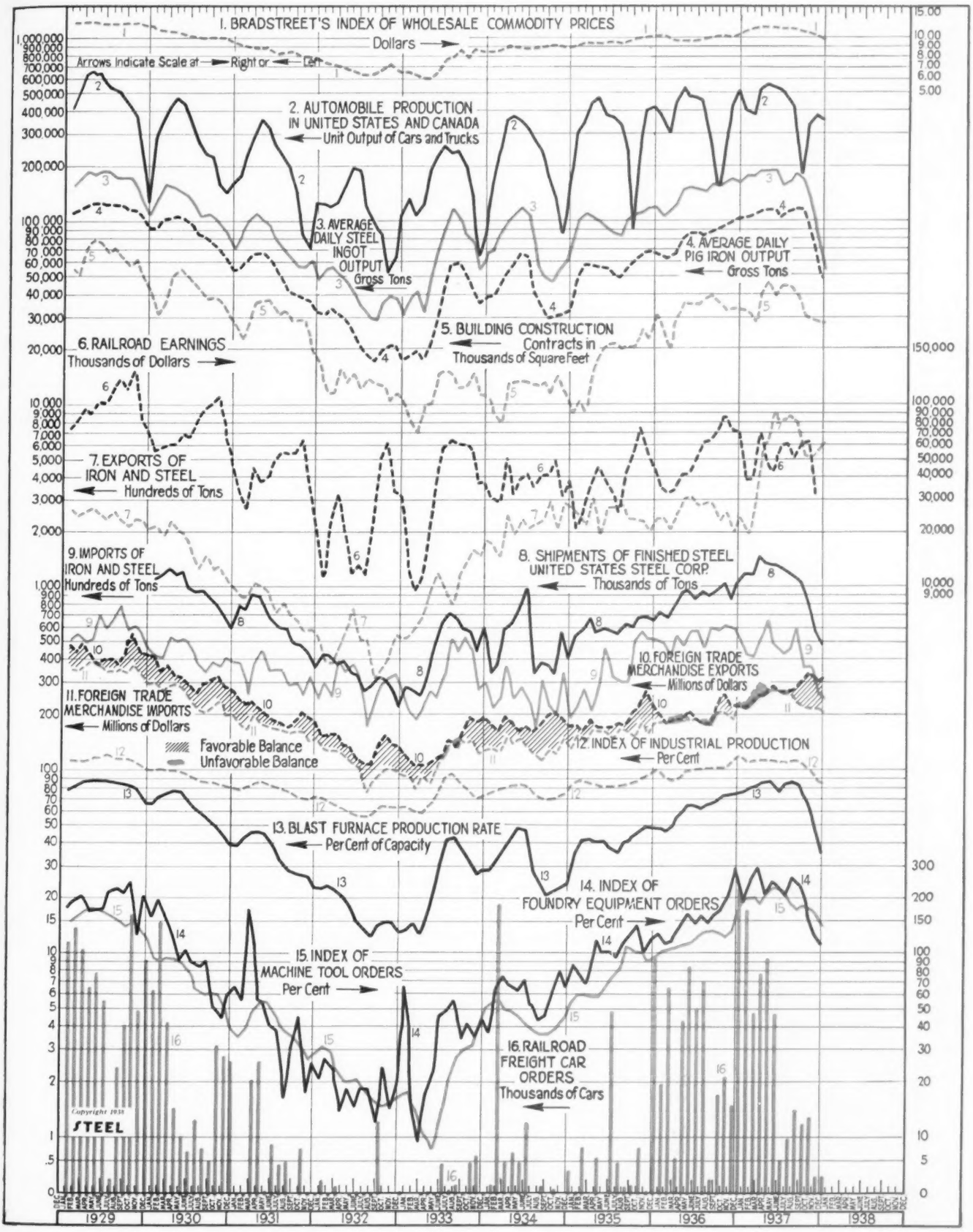
Week ending	STEEL'S Index of Activity Index No.		Steelworks Operating Rate Per Cent		Electric Power Output Million KWH		Freight Car Loadings		Weekly Auto Output	
	1937	1936	1937	1936	1937	1936	1937	1936	1937	1936
Oct. 30	95.7	99.1	51.0	73.0	2,254	2,175	771,655	814,175	90,155	66,985
Nov. 6	92.3	102.1	47.0	73.0	2,202	2,169	732,145	759,318	89,770	84,305
Nov. 13	86.5	107.9	39.0	74.0	2,176	2,169	689,614	784,672	85,325	104,248
Nov. 20	84.9	109.9	35.0	74.5	2,224	2,196	647,251	790,500	85,757	110,160
Nov. 27	72.7	105.2	31.5	75.5	2,065	2,133	558,627	679,984	58,955	104,283
Dec. 4	81.5	108.4	30.5	76.5	2,152	2,243	623,337	744,957	86,173	100,395
Dec. 11	80.5	113.9	27.0	77.5	2,196	2,278	622,131	738,747	85,765	119,455
Dec. 18	79.4	114.8	27.0	79.5	2,202	2,274	603,292	729,696	82,025	121,038
Dec. 25	69.5	93.3	23.0	68.0	2,085	2,080	460,367	562,218	67,230	79,019
	1938	1937	1938	1937	1938	1937	1938	1937	1938	1937
Jan. 1	62.7	96.6	21.0	79.0	1,998	2,069	457,359	587,953	49,550	71,800
Jan. 8	70.1	107.8	26.0	79.5	2,139	2,244	552,314	698,529	54,084	96,780
Jan. 15	74.4	106.7	29.0	79.0	2,115	2,264	580,600	700,238	65,735	91,685
Jan. 22	74.7†	104.0	30.5	80.0	2,108	2,256	570,333†	670,376	65,418	81,395
Jan. 29	73.7*	99.6	33.0	76.0	2,098	2,214	550,989*	659,790	59,365	74,148

*Preliminary. †Revised.

STEEL TREND

Key:	Dec. 1937	Key:	Dec. 1937	Key:	Dec. 1937	Key:	Dec. 1937
1	$9.77	5	28,718,400	9	25,792	13	35.6
2	346,886	6	$32,440,920*	10	$319,756,000	14	111.2
3	56,625	7	626,418	11	$208,863,000	15	140.8
4	48,499	8	489,070	12	84	16	275

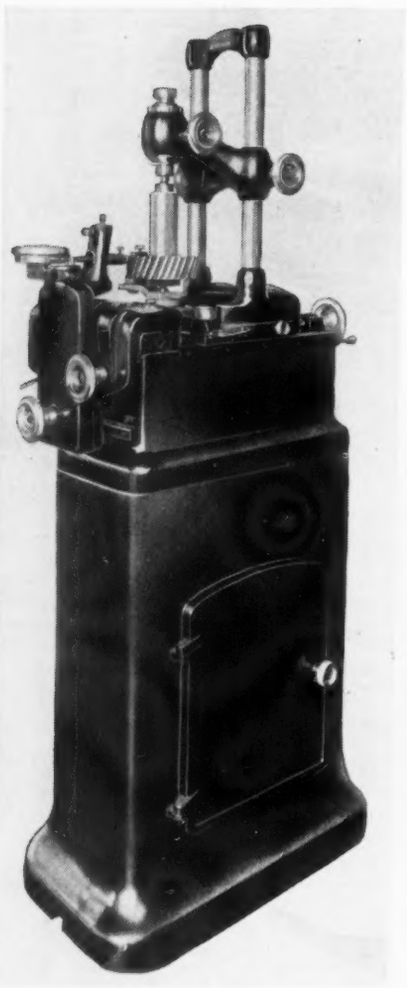
*November figures.



Key: 1. Bradstreets' Index (Average of Wholesale Commodity Prices. 2. Automobile Production in United States and Canada, compiled by U. S. Department of Commerce. 3. Average Daily Steel Ingot Output, compiled by American Iron and Steel Institute. 4. Average Daily Pig Iron Output, compiled by STEEL. 5. Building Construction, Contract Awards in 37 States, compiled by F. W. Dodge Corp. 6. Railroad Earnings, Net Operating Income for Class I Roads, compiled by Bureau of Railroad Economics. 7 and 9. Iron and Steel Foreign Trade, reported by Bureau of Foreign and Domestic Commerce. 8. Shipments of Finished Steel, United States Steel Corp. 10 and 11. Foreign Trade, Value of Exports and Imports, reported by Bureau of Foreign and Domestic Commerce. 12. Index of Industrial Production (adjusted for seasonal variation; average 1923-25=100) computed by Federal Reserve Board. 13. Blast Furnace Production Rate, compiled by STEEL. 14. Index of Foundry Equipment Orders (Average 1922-24=100), compiled by American Foundry Equipment association. 15. Index of Machine Tool Orders (Three-month moving average; average monthly shipments 1926=100), compiled by National Machine Tool Builders association. 16. Railroad Freight Car Orders, compiled by STEEL.

QUIET GEARS

Accuracy in gear teeth is the real answer to quietness, and correct inspection methods are the means of obtaining such accuracy. Herein the author describes inspection equipment and methods now available



By S. O. BJORNBERG
Consulting engineer,
Illinois Tool Works,
Chicago

■ IT IS UNIVERSALLY recognized that, after strength of gear teeth and general design have been satisfied, the element in gear manufacture that has caused more controversy than any other is noise.

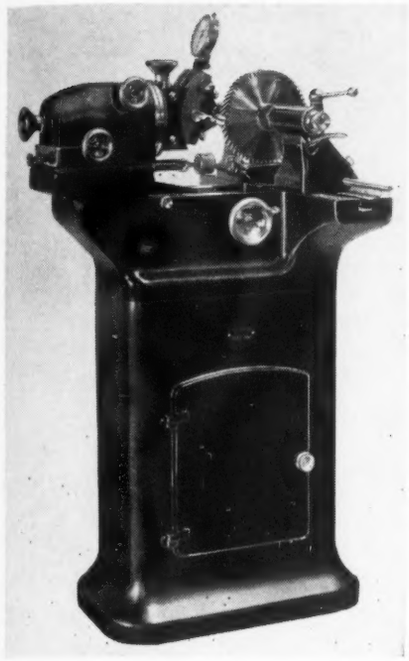
There have been many schools of thought and opinion on how to eliminate gear noise, such as modifying the tooth forms, dual pressure angle, taking off at the top and putting on at the bottom and vice versa and many others. Through the majority of these schemes has run the theory that accuracy of gear tooth parts is essential in combating noise. One group, mainly shop men, has felt that trick tooth shapes are the answer to quietness. The other group, mainly from the engineering end, has maintained that if gear tooth geometry were accurately reproduced on the production line, the finished gears would naturally be quiet. To obtain this desired accuracy in production has been the stumbling block.

Determination of the nature and amount of error in the involute curve is the function of this Illinois involute profile measuring machine

With all the acknowledged improvement in making quieter gears, there is still a persistent demand for less noise. This has given rise to many corrective devices, such as grinders, lappers, burnishers, and shavers. These corrective devices divide themselves roughly into two classes for "before furnace" and "after furnace" application. Burnishing or shaving operations are performed before heat treatment, and lapping or grinding operations after removal from the furnace. A common practice seems to be to make the gears incorrect originally, then correct them, then run them through the furnace, then lap them or grind them, or both.

Some shops prefer to lap gear teeth, but have endless discussions on how much and how long to lap. Finding the correct lapping time seems to be the secret, because it appears that if gears are lapped too long or too little they will not perform well.

The real truth is that lapping does not correct tooth errors but only polishes surface roughness. Because of greater sliding speed at addenda and dedenda of gear teeth, the lapping compound has more opportunity to cut at these points than it does at the dead area at the pitch line. Several schemes are used to create sliding action at the dead



This machine is designed to measure base pitch in the rotational plane and to check spacing in planes other than rotational

pitch line area, but as yet lapping has not proved to be the ultimate answer to quiet gears.

Other shops prefer to grind gear teeth but have to contend with the cost of this operation. Furthermore, when production is speeded up, tooth errors are caused by wear of grinding wheels, etc.

It is interesting to note, however, that when a pair of gears are ground accurately, they run more quietly under actual operating conditions than any other class of gear. When a pair of ground master gears are noisy in operation, the trouble is usually found in the design of the bearings and housings. Thus, master gears are used to "yardstick" the general design of a transmission or gear box. These results merely support the engineer's contention that it is accuracy that makes for quietness.

With all these schemes for making gears, it would seem that the solutions to all gear problems would long since have been discovered. But gears produced today are still being criticized for noise; furthermore, it seems difficult to maintain consistency in production without undue exercise of caution and careful inspecting.

It is the writer's opinion that the one major phase of gear manufacture that has been neglected or overlooked more than any other single item is correct inspection. Not that the operation of inspection in itself makes a good gear, but it certainly will point out where errors occur and thus guide the effort to correct them.

Of all machine shop activities, gear production has probably produced the most controversy but the least inspection equipment. No management official would consider putting a cylindrical grinder on the floor without providing the operator with the necessary measuring tools to see that his work is straight, true and to size. The same logic applies to a lathe, planer or milling machine.

Inspection Neglected

Yet in the gear cutting department it is quite common to put a machine on the floor, mount the hob or shaper cutter, pull the lever and take the results blindly. Some inspection equipment, of course, has been used, particularly since the advent of the first involute checkers on the market about 1919. Some of these homemade devices have been quiet ingenious, but the general trend of checking, if any was done, was for involute curve and then a rolling check with another gear.

Not all, but most of these checking devices have a common characteristic fault. They are slow and do not give the same results twice in succession. It is not uncommon to get three different readings from three checks on the same spot on a gear tooth. The criterion of a good measuring device is, of course, its ability to repeat its readings on subsequent checks.

This raises the question as to how fine a gear checking device should measure. The writer believes that they should be able to check to 0.0001-inch. Gears need not necessarily be made to ten-thousands, but the operator should be able to read in ten-thousandths. Then the running condition of the gears can determine what tolerances will be satisfactory for quiet operation. It is obvious that slow-moving gears need not have the accuracy that high-speed gears require, where the tooth impact vibrations are so great that they set up a howl. Now then, what are the elements in a gear that contribute to noise?

A spur gear has two noise contributing elements, involute profile and base pitch. A helical gear has three noise contributing factors, the two previously mentioned and helical lead. Error in any one or all of these basic elements will produce noise in direct proportion to the peripheral speed of the gear.

Gear makers have long been familiar with the involute profile and its method of inspection, but base pitch has been a rather unknown term in the gear shop. Engineers are familiar with it, but shop men, if they have thought of it at all, have considered it as spacing, and any inspection of this nature that has been done has as a rule been a spacing check at the pitch line.

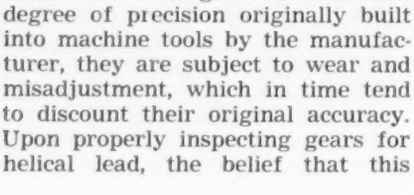
Discover Curious Conditions

Base pitch is the distance between two gear teeth along the line of pressure, along which line the mating teeth engage. Since the introduction of base pitch checking equipment, some very curious conditions have been discovered about "spacing" on gears produced by different methods. Many gear makers were unaware of the existence of the spacing errors found until they were convinced by this form of inspection. It can be definitely stated that base pitch is both the index to gear per-

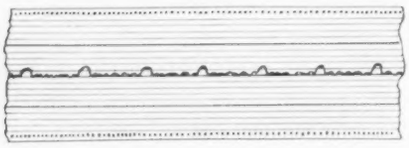
By rotating a gear with a ground master gear, this gear charting machine will chart combined errors in tooth profile spacing, interference and eccentricity

formance and the yardstick of quietness in gears.

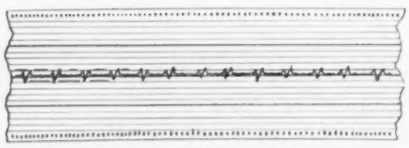
Similarly, it has been generally accepted that helical lead was correct simply because gear calculation on a hobbing machine was accurate to the sixth or seventh decimal place, or that formers on the shaping machine or other methods of producing helical gears automatically made them correct. Regardless of the fine degree of precision originally built into machine tools by the manufacturer, they are subject to wear and misadjustment, which in time tend to discount their original accuracy. Upon properly inspecting gears for helical lead, the belief that this element was correct "per se" has been discarded in many cases.



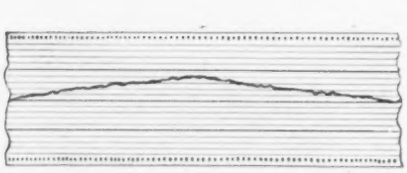
Regular curves, one for each tooth in the gear, as made by the gear charting machine, indicate incorrect pressure angles



Humps charted at regular intervals indicate uneven tooth spacing; occasional humps indicate mutilated teeth, foreign particles or chips



Partly smooth and sudden waves in the line for each tooth contact indicate interference or too much tip relief on gear teeth



A long curved line indicates eccentricity; the amount is indicated by the number of ruled lines covered; each space indicates 0.001-inch

It is not sufficient that the machine be geared up to the proper ratio, but it is also necessary that the machine maintain the correct angular velocity during the pulsating cutting action of gear production over a long period of time. Therefore, the proper inspection approach to the gear itself will uncover machine errors, and thus help machine tool operators to better meet these requirements.

By pursuing these methods, it will in many cases be possible to produce uniformly accurate gears at the outset without the necessity of running them through corrective devices "before furnace." If any correction need be done, it should be performed "after furnace," and should be due solely to distortion arising from heat treatment and not from workmanship errors.

The writer has had the opportunity to be of assistance in developing the Illinois line of gear measuring machines, which were evolved to provide rapid set-up and quick, accurate readings for the general run of automobile, truck and tractor gears. Some of the lessons learned should be of general interest.

A general commentary that applies to any precision measuring instrument is that it must be ruggedly constructed. It has been our experience that in building any fixtures that must measure in ten-thousandths and repeat successively, they must be constructed of some heavy material such as cast iron, because it is impossible to measure successfully with thin, flimsy devices that vibrate like a fish pole. And yet these heavy moving parts must move as easily as if they were floating on a film of oil. It is this reduction of frictional resistance and inertia that makes it possible to check to ten-thousandths of an inch.

Hold on Centers

In addition, we have found that the best method for accurate checking is to hold work on centers, rather than locating from any other surface. Wherever possible, production is done on centers, and they are therefore the logical place to work from.

In each of the four measuring machines, the "monument" method of checking is used, because of its inherent advantages over the "adjustable" or other types of checking. Experience has proved the worth of this method, because repeated use by different operators does not alter the monument's basic accuracy, whether it be a base circle, test bar or master gear. Its biggest advantage over "adjustable" checking is the virtual elimination of errors caused by the personal equation. Another advantage is the speed with which monuments can be changed.

To determine the nature and amount of error in the involute curve is the function of the involute profile measuring machine. The distortion of involute curves occurs in ordinary production from many causes, but chiefly from improperly sharpened gear cutting tools and torsional strains set up during the cut. The involute curve is checked to 0.0001-inch without the method of checking or the equipment used introducing any errors of themselves that will confuse the readings, and without complicated moves on the part of the operator.

Checking Methods

Cluster gears or gears integral on shafts can readily be reached by moving the indicator slide to the desired position. Shaper cutters may be held on shoulder arbors and easily checked on either side of tooth by merely swinging the dial indicator from right to left position. Spiral or helical gears may be checked simply by turning the contact finger to the approximate slant of the spiral in the gear. The entire mechanism operates so easily that it may be moved with the little finger.

A sector graduated in degrees permits the involute curve to be checked in increments which may be plotted on a graph for record purposes. Base circles must be made for each different size and type of gear to be checked. In most cases, this is only a cast-iron disc ground to the correct diameter.

Imperfect machining and heat treating distortions in spur and helical gear teeth can readily be discerned with this involute check, thus pointing out the steps which must be taken to correct the errors.

The machine for measuring base pitch and space is designed to measure rapidly base pitch in the rotational plane of gears, and to check spacing in various types of gears in planes other than rotational. The operation is semiautomatic, and the average automobile, truck or tractor gear of 30 teeth may be checked easily on all teeth in a few minutes.

Spur, helical, bevel and worm gears may all be checked with equal ease. The machine may be used on its own bed or it may be clamped to any device that has a pair of centers. Spacing errors are discovered that occur in the various methods of making a gear, whether hobbed, shaped, shaved, burnished, lapped or ground.

Since a gear may have correct spacing at the pitch line, but still have spacing errors along the line of action because of the involute curves varying from tooth to tooth,

the machine checks spacing both at the pitch line and along the line of action as well. Thus the combined spacing and involute errors are shown.

It is possible to make a gear that has correct involute curves on all teeth and still be noisy, because of poor spacing. It is also possible to make a gear that has correct spacing on all teeth at the pitch line and still run noisily because of incorrect involutes. Inasmuch as the line of action is always tangential to the base circle, the latter is merely mounted between centers and the contact finger brought up to it. The base circle is the same as is used on the involute checker.

The swivel head is first set to the approximate pressure angle. By placing the head on a swivel, checking is kept in the central zone of the gear, thus avoiding the extended dimensions necessary if the fingers were moved up or down in the vertical plane only. Therefore, the head need not be set to the precise pressure angle, because it is the base circle itself which gives the right pressure angle.

Base Circle Removed

After the contact fingers have been brought up to the point of tangency, the inward stop screw on the horizontal head is locked at this position, and the base circle is removed and replaced by the gear. Then the fingers can be moved downward to the tangent line to any position within the scope of two adjacent gear teeth. The lower contact finger is then locked in position, and the upper finger is brought against the next tooth until the dial indicator shows about a quarter revolution.

Then the ratchet finger at the bottom of the gear is adjusted against a tooth. When the horizonal head is moved outward, this ratchet finger slips into the next tooth, and, as the horizontal head is brought inward to its stop, the ratchet finger brings the gear around to present a new pair of teeth to the contact fingers. Thus a gear can be very rapidly checked, and no matter how hard the operator presses against the inward stop, he cannot affect the reading because the ratchet finger springs hold the gear tooth against the lower contact finger with exact tension.

Helical gears can also be checked for circular pitch normal to the helix angle, but in so doing the fingers must contact on the pitch line and not on the line of action. The swivel head is brought around to a perpendicular position, and the entire unit is then rotated to the helix angle of the gear by means of a graduated ring. However, it is much better to check a helical gear in the plane of rotation, because then only can the base pitch be checked.

Worms can also be checked for spacing by turning the head so that contact fingers will lie in the axial plane of the worm.

It may be stated that a spur gear transmits motion to another gear by means of its tooth curve, while a helical gear transmits motion principally through its pitch helix. Therefore, it is just as important that pitch helix or lead be correct as it is essential that involute curves be accurate.

When helical gears first made their appearance in automotive transmissions, it was generally accepted that the lead was accurate simply because the machine tool made them that way, or was supposed to at any rate. However, inspection has revealed some rather surprising errors, as much as 0.002-inch for 1-inch face of gear. This is as bad as if the involute curve were in error 0.002-inch.

A helix is simply the product of rotation and translation, and to check it properly, correct rotation and translation must be employed.

As to the operation of the helical lead checker, a horizontal slide transmits motion to a vertical slide by means of a sine bar. The vertical slide in turn transmits motion to the main spindle by means of steel tapes wound over a drum. Both the horizontal and vertical slides run on V-groove ball tracks which can be tightened to eliminate all backlash and still permit a "floating" movement of the slides.

The pivot carriage which runs on the sine bar has four preloaded ball bearings set so tightly that no backlash can occur. The sine bar is set by micrometer measurements over the pin and blocks. This measurement can be made on both sides of the pin to prove the results.

The sine bar operates from the horizontal to the vertical position, either right or left, thus being able to check a spur gear zero lead or a worm zero lead. To set the sine bar, the lead of the gear must be known. However, a gear of unknown lead can be quickly calibrated by merely setting the sine bar somewhere near the helix angle and then watching the dial indicator as it contacts the gear tooth.

By using the hand wheel to adjust the sine bar as the horizontal slide is stroked back and forth, the dial indicator needle can be brought to zero, and the lead reading can then be taken from the pin and blocks. In other words, the machine is checked against the gear of unknown lead, instead of checking the gear against the machine.

When the sine bar is in the horizontal position and up to 45 degrees, the horizontal slide is the prime mover, and when the sine bar is vertical to 45 degrees, the vertical slide is the prime mover. This is accomplished simply by pulling the hand wheel in or out.

When very short leads requiring more than one revolution are to be checked, a "step-up" is attained through the use of a pair of ground helical master gears within the head.

The machine gives a continuous check along the helix and thus re-

Checking the pitch helix or lead on helical gears, on a machine of this type, is just as important as determining that the involute curve is correct

veals any undulations that occur. Spot checking of a helix, such as is done in an ordinary toolroom operation, only shows how good the two spots are and does not show what is in between. The dial indicator can be swung around normal to any helix and the dial indicator head can be instantly moved in or out or backward or forward to accommodate any gear.

A test bar is used for calibrating the machine. Should there be any reason to question the machine's veracity, the test bar can be placed between centers and the machine set up for even inch leads. The test bar's accuracy can be proven by ordinary toolroom inspection methods. This is again a "monument" check.

Waves Denote Error

The principle underlying the design of this machine is that a gear rolling with a ground master gear will compel the inking pen to draw a line on the paper chart as it unwinds. A wavy line denotes error, but as a rule this is a combined error of tooth, profile, tooth spacing, tooth interference and eccentricity.

It is somewhat difficult to determine from the chart just which error is causing the trouble. Therefore, it is necessary to have individual instruments for checking involute profile, base pitch and helical lead. However, the gear charter has a good psychological effect on the personnel in the gear cutting department in that they can see just how the finished gear will run.

The chart also becomes a permanent record of the gears' accuracy as they left the inspection department, and may prove to be valuable evidence of the gearmaker's integrity in the event that they are returned by the customer as being below specification.

The back bed and centers operate on a swivel, and permit the work gear to oscillate according to its tooth errors. This motion is transferred to the inking pen which draws a line on the chart.

Use of two pairs of centers permits the quick mating of cluster gears in whatever position they may be. Ordinarily the machine is operated by an electric motor, but gears may also be rolled by hand to determine just where the jump per tooth occurs. Gears may also be checked for center distance, backlash and any other check that may be performed on a hand rolling fixture.

Ground master gears are used as the "monument" against which checking is made, to avoid the errors which result when work gears are used.

Conclusions drawn by the writer from extended experience are that: Trick tooth shapes are of no value and are only an attempt to circumvent imperfect workmanship; accuracy in gear teeth is the real answer to quietness, and correct inspection methods are the only means of obtaining such accuracy; quietness can be proved with master gears; accurate checking of gear tooth elements will point out to the machine tool builders why and where to make improvements; gears can in many cases be made initially quiet "before furnace"; corrections need only be necessary "after furnace"; it is as easy to make correct and quiet gears as poor gears, when these requirements are understood.

This is the writer's conception of the possibilities in the gear field which proper inspection has pointed out. And these objectives are fast becoming realities, because where proper inspection methods have been carried to their logical conclusion, we have already seen signs of quiet "green" gears.

High Strength Alloys Covered in Handbook

■ Bridgeport Brass Co., Bridgeport, Conn., has just released a new 80-page technical handbook covering the physical properties of four high strength silicon bronzes pioneered by the company and sold under the name Duronze bronze. These are recommended by the company for severe service in outdoor construction where steel, brass and copper are not strong enough or do not have sufficient corrosion resistance, and are said to rank in importance with the development of stainless steels in the ferrous industry. Duronze I has fine cold-working properties, its strength being the result of cold drawing or rolling, and is recommended for bolts and screws.

Duronze II has the strength and toughness of mild steel plus the corrosion-resistance of bronze. In form of hot-rolled sheets, it is well adapted for making non-rusting tanks. Duronze III is a hot working alloy strong and hard but free turning and readily forged. Duronze IV is supplied in tubular form for condenser tubes. The handbook contains considerable engineering data.

Casting Metal Direct From Molten State

■ A new method for continuous casting of metal direct from the molten state has been announced by Dr. Byron E. Eldred, 51 East Forty-second street, New York, president of the Engineers' club of New York. This development, he says, has resulted from discovery, during six years of research work, of hitherto unrecognized physical phenomena attending the freezing of metal.

Rods, bars, tubes and plates produced by the new method, known as "draw casting", he stated, are of a quality superior to that of such products as hitherto made. The castings are so dense, as cast, that there appears to be no increase in density on further working and annealing. In the case of copper cast by this method the density, as cast, exceeds the absolute density of this metal as it previously has been accepted.

"The principle of the process", says Dr. Eldred, "is the orderly removal of heat to provide like crystal growth throughout the cast shape. Superheat from the metal is removed as a separate and distinct step in operation, followed by the uni-directional removal of latent heat in a separate path of heat flow. This provides for uninterrupted freezing and is evidenced in a metal such as copper by a single crystal many feet long in a rod ¾-inch in diameter.

"There is no apparent reason why this method should not be applied to casting ferrous as well as nonferrous metal shapes."

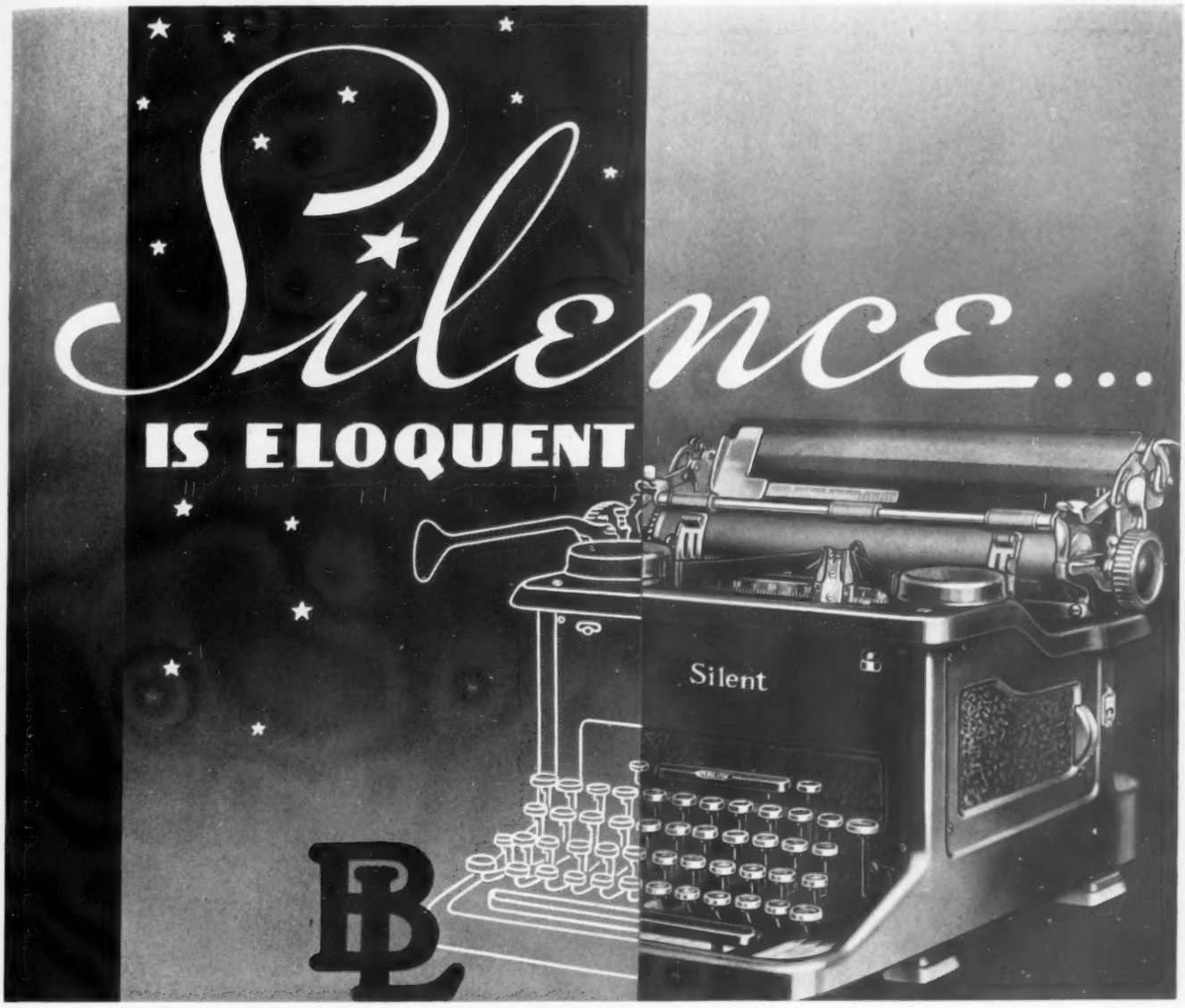
Expert Will Speak on Theory of Inhibitors

■ G. Walter Esau, manager, metal working research department, E. F. Houghton & Co., Philadelphia, will address the Peoria chapter of the American Society for Metals, in Peoria, Ill., Feb. 14, on the subject "The Electrolytic Theory of Inhibitors." The speaker has been associated with the development of pickling inhibitors for the past 16 years. The electrolytic theory of inhibitors has received widespread attention here and abroad, and, according to Mr. Esau, the principle involves the formation of electrolytic insulating films over the grain boundaries.

Will Show New Testing Device in British Fair

■ An instrument with which engineers may test hardness and wearing properties of metals and may observe the effect of wear with different grades of lubricants will be exhibited for the first time in the Birmingham section of the British Industries Fair to be held Feb. 21-March 4. According to the announcement, the new invention is superior to anything produced heretofore and it is expected to become standard engineering equipment.

With this instrument, it is said the engineer can find out, for example, exactly what happens to crankcase bearings when an automobile stops and starts. He can also examine various alloys under continuous load or when subjected to the strain of intermittent stopping and starting.



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High Speed Steel—Some Less-Known Uses

By ERIC N. SIMONS
Sheffield, England

■ THE AVERAGE machinist looks upon high speed tool steel as wholly and solely a material for the manufacture of efficient cutting tools, as lathe, planer, shaping and slotting tools, milling cutters, and the like. There are, however, a number of less-known uses for which high speed steel is excellent.

First, one may mention pneumatic chipping chisels for chipping surface flaws off steel billets. These chisels have points quite dissimilar to those of ordinary chisels. To obtain the best results, they need to be heated up in a blacksmith's hearth to about two inches from the point. They can be hardened by rapid cooling in oil or in a cold air blast.

Another interesting use is for circular splint halving knives. These knives are mounted on a spindle, which revolves at about 1000 revolutions per minute. The splints in random lengths are fed past these cutters and lie parallel to their axis, being thereby cut into the required lengths. The cutters have to be hard, so that the edges will not roll over. For this purpose, a 14 per cent tungsten high speed steel is eminently satisfactory.

Sugar Cane Cutters

Another application is in the teeth for cutting and shredding sugar cane. In certain machines for this purpose, the shredding is done by a roller having teeth all over its surface and running at a high speed, while shredding against the teeth of a second slow speed roller, toothed in such a way as to offer the best opposition to the path of the cane through the rollers. The rind of the sugar cane is extremely hard, and only the hardest steel will stand up to continuous work. The mills run continuously 24 hours a day for 6 days a week, and about 1500 tons of cane are shredded per day in the machine. As the teeth become blunt, the horsepower required to drive rises quickly. Occasionally pieces of metal, such as a spanner or carrier-chain link, creep into the cane and pass through the rollers.

Teeth of 14 per cent tungsten high speed steel have prvoed highly satisfactory for this purpose, though even they will not stand up to severe impact with pieces of foreign metal. They are usually given a special temper, which enables them better to withstand severe strains.

Another interesting use is for planing stone, particularly Portland stone. This varies considerably in texture. The stone is machined dry, but often it is moist from the water used in the previous process of sawing it to size for the machine. When running off for molding, a very heavy cut (approximately ½-inch) is usually taken, and this is the heaviest work the tools have to do. The roughing out tools are about 2 inches wide, made from 1¼-inch square steel, and they cut full width each time. The speed is 30 feet per minute, and the feed 5/16-inch. The finishing cuts to form the faces are only just as scrapeover, so that it is the heavy roughing cuts which are most severe on the tools. A high speed steel containing over 20 per cent of tungsten has been found the most suitable for working on stone at the speed, feed, and cut mentioned.

Little Known Use

A little-known use for high speed steel is for an endless chain. The particular chain for which it is used is about 70 feet long in all, with a lateral speed of about 6 feet a minute. The steel has to be capable of overcoming friction and rubbing, other resistances being negligible. The chain in question is placed in a reducing medium, and floats upon the surface of a lead bath at 600/650 degrees Cent. Thus, the metal has to meet two conditions. Firstly, it must not become distorted (i.e. elongated) to any extent at a temperature of about 700 degrees Cent., and must have a high tensile strength. Secondly, it must, for preference, be easy to machine. To meet these conditions, no steel has proved superior to a 14 per cent tungsten high speed steel containing 0.6 per cent carbon. At 700 degrees Cent. this steel has an elongation of 16-17 per cent. At a tensile strength of 24 kilograms per square cent (340 pounds per square inch) the steel is forged from 900-1150 degrees Cent. It is hardened at a yellow white heat (1100-1150 degrees Cent. approximately) in oil. It can be readily machined.

One of the most unlikely purposes, to outward seeming, for which high speed steel could be used is that of anvil forgings, yet cobalt high speed steel has been successfully used for certain forgings of this type, where rolling is done by pressure, free from blows. The anvils are used for hot work, and there are no shocks.

Even more interesting is the employment of high speed steel containing cobalt to scrape minute particles from exceptionally hard alloys for research purposes in a laboratory. It was necessary to obtain particles so minute that they would pass through a sieve of 250 mesh to the inch.

Ordinary Steel Unsatisfactory

While it was possible to make an indentation with a hardened tool, it was quite impossible with ordinary tool steel to scrape from the alloy the particles which, when obtained, were to be a really fine powder. The trouble was that if enough pressure was applied, the pieces or particles were too coarse, and also included some of the medium employed, which made the result useless. Again, if a light pressure were used, the result was entirely negative. The tools would not "touch" the alloy. With cobalt high speed steel, however, such results were obtained that after operating for fifteen minutes, the tool showed no signs of wear, and the particles scraped off were in every way suitable.

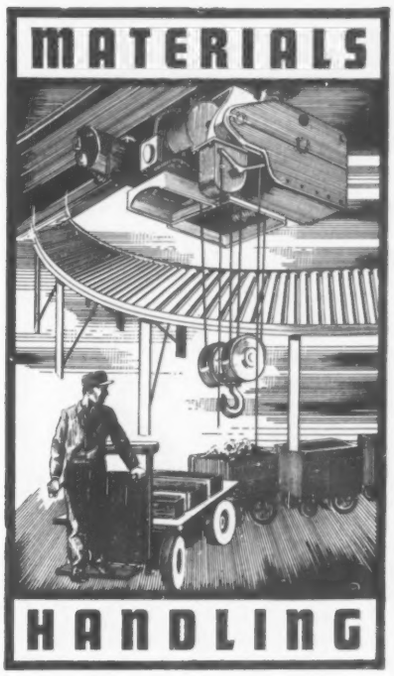
Tobacco knives are another type of tool for which 18 per cent tungsten high speed steel is eminently suitable. These knives are approximately 2¾-inches in diameter, and are employed for cutting the tobacco leaf. This leaf is sometimes dusty, the dust being largely composed of sand, and the knife is therefore subjected to an abrasive action.

Iron, Steel Plants in New Trade Directory

■ *Directory, Iron and Steel Plants*, 1938, fabrikoid, 452 pages, 5 x 7½ inches; published by Steel Publications Inc., Pittsburgh; supplied by STEEL, Cleveland, for $10; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

This, like its predecessors, presents a list of companies and officials operating blast furnaces, steel plants, rolling mills, by-product coking plants, structural steel plants, and boiler shops in the United States and Canada. The listings have been revised and brought up to date, reflecting all changes since the previous edition. Following the alphabetical listing by name of company is a geographical index, grouping companies by location.

A valuable feature is a statement of equipment and products of the various companies and in many cases the capacity, capital and railroad facilities.



Ore Belt Conveyor

Unusual features incorporated in system which handles constant flow of 750 tons per hour at speed of 500 feet per minute

■ MANY UNUSUAL features have been incorporated in a materials handling system recently placed in operation by Oliver Iron Mining Co. at its Spruce mine at Eveleth, Minn.

By means of an extensive co-ordination of belt conveyors, a continuous flow of iron ore is assured from the deposit to a railroad shipping pocket 4500 feet away, shown in Fig. 1. The total vertical lift involved is 386 feet. This system is believed to be the largest used for iron mining and one of the most extensive in the entire metal mining field. It handles a constant flow of 750 tons of ore per hour, moving at a rate of 500 feet per minute.

There are nine individual conveyor sections, one of which is shown in Fig. 2. Each lifts and passes the ore upward until it is dumped finally into a 500-ton receiving pocket for loading into railroad cars. Each section has a 4-foot, lagged, driving pulley connected through a semiflexible coupling to a totally enclosed speed reducer, which is driven by a 75-horsepower, 2200-volt, splashproof motor. The automatic control is totally enclosed, oil-immersed, and the entire system is interlocked to assure power sequence in starting and stopping. Thrustor brakes provide uniform deceleration and hold against run-backs.

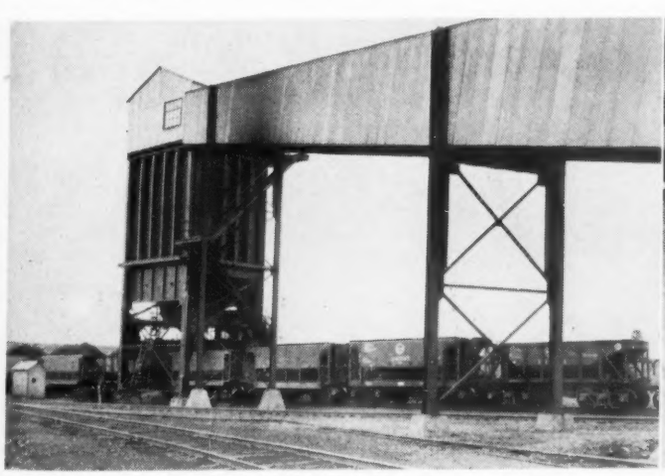
Some interesting sidelights are provided in connection with this novel installation. The conveyor is completely enclosed in a steel gallery, Fig. 3, approximately 1300 feet long from the point at which it appears above the surface of the ground to the receiving pocket. The motors are equipped with electric heating units to prevent possible damage from moisture during the off shifts. One of the problems which arose in the development of the system was the prevalence of mildew. To overcome this, a mildewproof conveyor belt was developed and is said to be proving highly satisfactory. Special impact rollers for the conveyor carriers under the loading points were developed by the conveyor manufacturer.

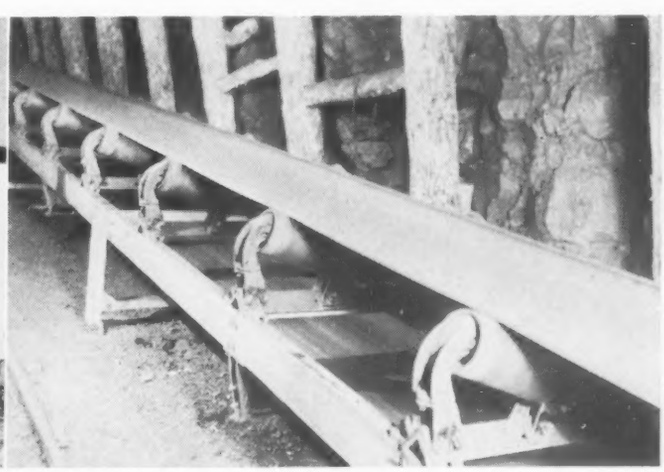
Previous practice of handling ore from the open pit mine to the loading point had been to load it into cars and transport it via terraces and benches around the side of the pit up to the surface, the cars being pulled by locomotive. When the pits had reached considerable

Fig. 1—Loading bin at head end of conveyor system handling ore at Oliver iron mine, Eveleth, Minn.

Photos courtesy Stephens-Adamson Mfg. Co., Aurora, Ill.

Fig. 2—Portion of belt conveyor in underground entry. Entire system uses nine individual conveyor sections. Incline here is approximately 20 degrees





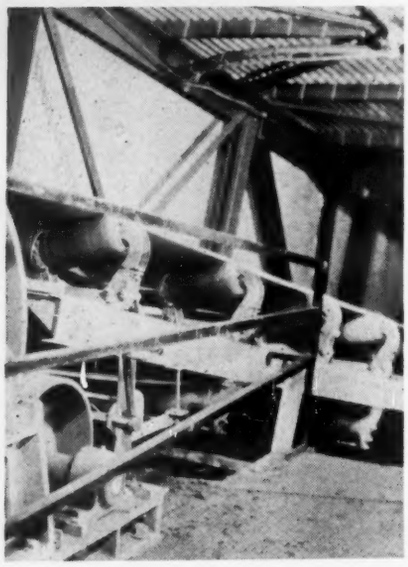


Fig. 3—Belt conveyor is completely enclosed in steel gallery, a distance of approximately 1300 feet from point above surface to receiving pocket

depth, it was believed that some other method of handling would prove more economical. After considerable research, the new conveyor system was adopted. Three vertical shafts in ore were sunk to the bottom of the ore body. These shafts are spaced on approximately 500-foot centers. A pan-type conveyor at the bottom of each raise feeds the belt conveyor. The shafts are connected by a tunnel which also extends on a 20-degree slope up to the surface. The system of nine interlocking belt conveyors, each 30 inches wide, totals very nearly a mile in length with belt speeds of 500 feet per minute.

Another interesting feature of the installation is the use of a fleet of four 20-ton motor trucks, Fig. 5, for discharging to one of the three vertical raises. The other two raises are each fed by means of a special, tower-type, dragline excavator operating a 3-cubic yard scraper.

Conveyor belts are 30 inches wide, of 7-ply, 32-ounce duck with rubber skim coats between plies. Carrier rolls are spaced at 3-foot 6-inch centers and lower return loads at 10-foot 6-inch, except at feeder and transfer points. At the latter, carrier rolls are closer spaced and are of soft rubber.

Approximately 70 per cent of the conveyor system is actually underground, and travels in an entry driven most of its length in ore. Two different methods of excavating and delivering ore to the raises are used. At raises Nos. 1 and 2, tower excavators operate at an average radius of approximately 170 feet. For clean-up work they can operate up to 700-foot radius. The 3-cubic yard drag scraper, a motor-driven caterpillar, mounted anchor tower and rotation of the rig on its 30-foot diameter circular track above the raise are all in full control of the operator from his cab in a 100-foot high tower. On raise No. 3, ore is excavated by an electric shovel served by the 20-ton trucks.

Steel Distributor Has Unusual Facilities

■ One essential to efficient handling of steel in distributors' warehouses is the location of the building alongside a railroad right-of-way, or close enough to it so that switch tracks may be extended to the plant and, where feasible, directly into it. A distributor must be in position to render speedy service to the trade, and this requires methods whereby carload lots arriving from the mills may be unloaded with minimum expense and delay and outgoing shipments accorded similar rapid handling.

When Bancroft Steel division, Worcester, Mass., of Reliance Steel Corp., Cleveland, was seeking a new location for its business a few years ago, the problem of transportation facilities was solved by taking over an abandoned freight station of the Boston & Maine railroad near the heart of the city's commercial center. Although it had stone walls 2 feet thick and a comparatively low ceiling, the fundamental advantages of location were so valuable to a distributing organization as to offset to a considerable degree the disadvantages of the building.

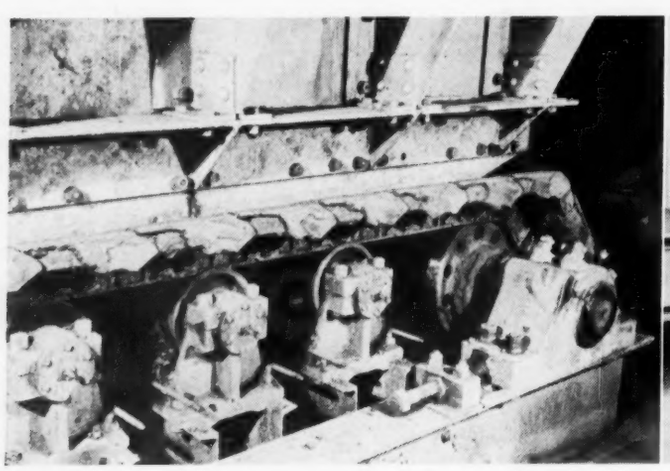
As the business expanded, a modern brick and steel extension of the older unit was constructed. At the same time, it became necessary to install an electric overhead traveling crane in the original unit to provide more adequate handling facilities. The low ceiling and general construction of the former freight house required special runways and a crane with close headroom. The floor of the warehouse had an 18-inch slope from one end to the other. As the roof paralleled the floor, the crane runways were on a similar grade.

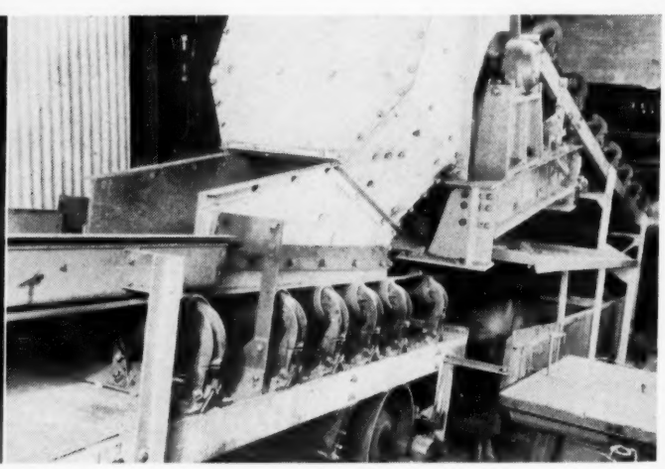
Installed over a year ago, the crane is kept busy almost 24 hours a day. It has a span of 60 feet, 5-ton capacity and is a 3-motor unit with cage control and fast speed. It is equipped with floodlights and has a 5-ton lifter for picking up and transporting heavy packs of sheets. Shortly after this unit was placed in operation, its advantages were so apparent that a few months ago a similar additional crane and lifter were installed in the new addition to

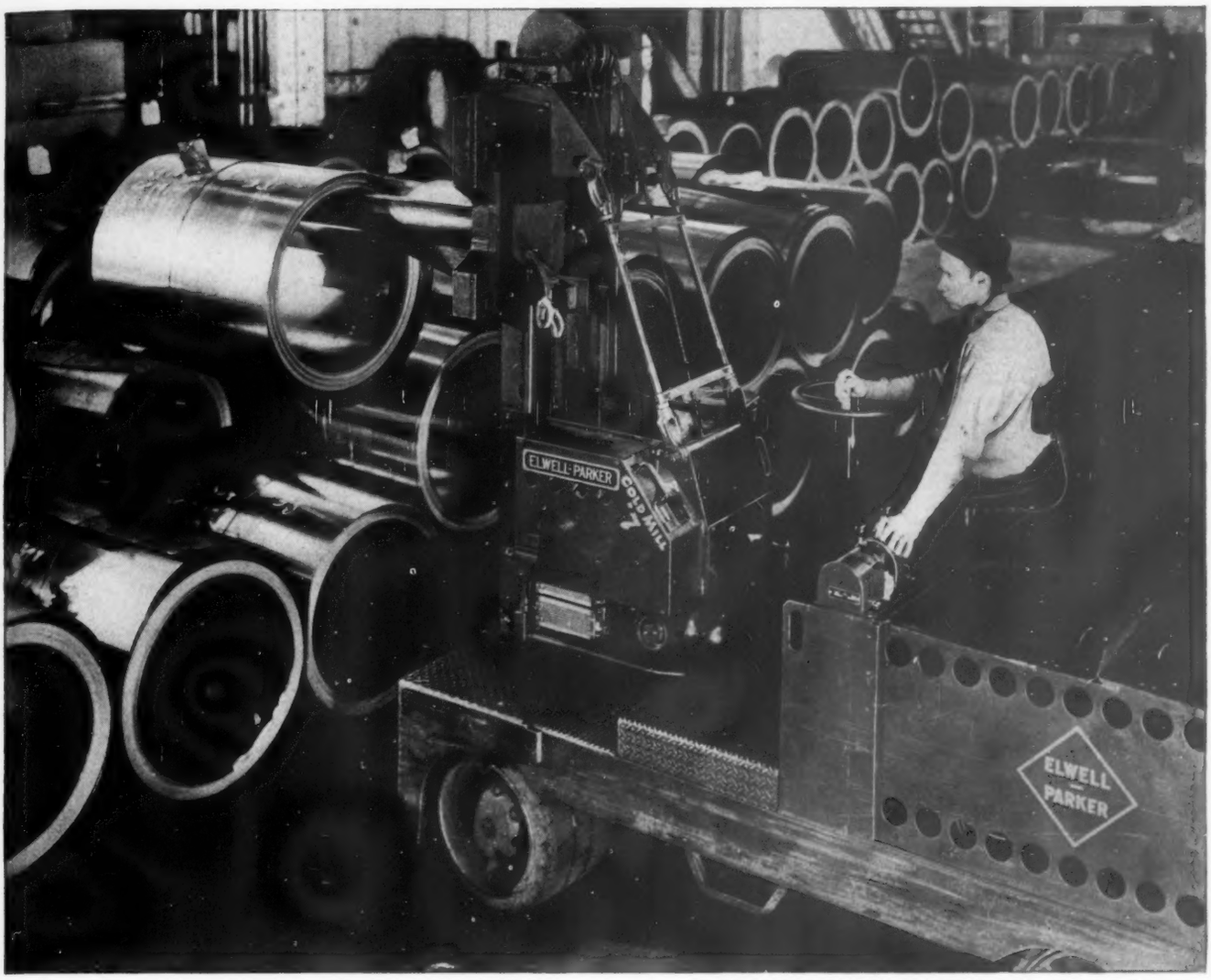
(*Please turn to Page* 81)

Fig. 4—This is one of three manganese steel feeders which feed ore from shafts to conveyor

Fig. 5—Close-up of junction point between underground inclined belt conveyor and horizontal conveyor section







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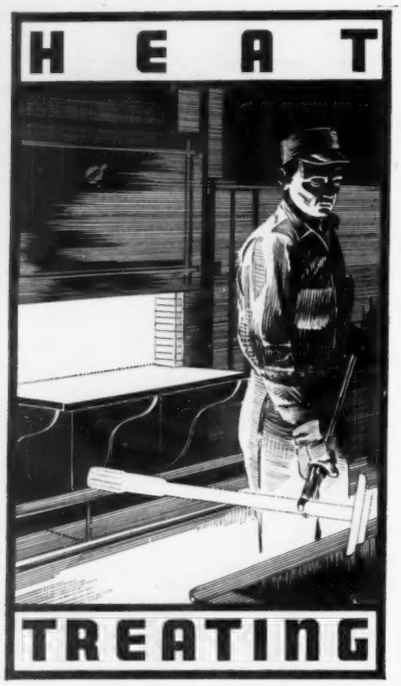


Tractor Tracks

Many tractors have traveled, on their original tracks, a distance greater than the earth's circumference. This is a result of careful fabrication control and heat treating

By H. J. GREGG
Surface Combustion Corp.,
Toledo, O.

■ ABILITY of a track-type tractor to lay its own track, travel smoothly forward on it, pick it up and relay it endlessly, enables it to convert a maximum of horsepower into pull, regardless of the nature of the ground—soft soil, mud, sand, snow or rock.

So tracks may have the strength to withstand punishment in the form of many varied and combined stresses, requirements that necessarily are exacting have been set up for steel analysis and heat treatment of the component parts. The track is composed of three principal parts, the shoe, the link and the pin and bushing, and is driven by a drive sprocket, as shown in Fig. 6. This article will cover the heat treatment of three of these important parts by Caterpillar Tractor Co., Peoria, Ill.

While there are several different types of track shoes, this discussion will be confined to the grouser type shoe shown in Fig. 3. This shoe is rolled exactly to shape in long sections of SAE 1045 steel. It is received in this form and the first operation is shearing to the proper length. After shearing, the shoes are heat treated, being hardened and drawn in the furnaces shown in Figs. 4 and 5. Fig. 4 shows the charge end of the hardening furnace at the right and the discharge end of the drawing furnace at the left. Each furnace has capacity of 1500 pounds per hour. The hardening furnace has internal width of 4 feet 6 inches and an internal length of 20 feet. It is equipped with a drag-chain type of conveyor, the width of which is 40 inches. It is heated by means of automatic, proportioning, high-pressure gas, single-stage velocity burners firing staggeredly both above and below the work to assure uniform heating. The temperature is automatically controlled by three motor-operated, controlled valves connected to thermocouples and indicating controllers on the first two zones and with a recording controller on the last zone.

Burners in the heating zones are of such capacity as to bring the shoes and conveyors to temperature of 1530 degrees Fahr. in approximately 40 minutes. The holding zone is on separate temperature control with the burners of such capacity as to soak the shoes for 10 minutes, making a total cycle of 50 minutes. Four small burners are used to provide a flame screen for other special work which is held

Fig. 1—Tractors are subject to severe and varied stresses in service. This view shows Caterpillar tractors and LeTourneau carryalls moving dirt in a hurry at Glendale, Calif.

at temperature and manually discharged into the quench tank, the purpose of the flame screen being to retard the infiltration of air and subsequent oxidization. Ordinarily the shoes are discharged immediately and automatically through a quench chute into the quench tank. The quench tank conveyor has variable speed drive. Quenching time is carefully controlled according to the size of the shoe. As quenched the shoes have a Brinell hardness number of approximately 300.

From the quench tank, the shoes are automatically conveyed to the

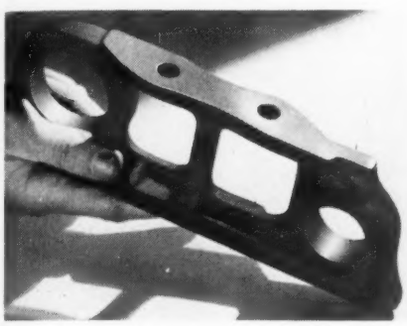


Fig. 2—Tractor track link, forged from SAE 1045 steel

draw furnace shown in Fig. 5. The draw furnace is heated by hot recirculated air from a single, direct-fired, air heater shown on top of the furnace in Fig. 5. This furnace has the same capacity as the hardening furnace, 1500 pounds per hour.

Conveyor for carrying the work through the furnace is of the flight type. It consists of three heavy chains with attachment links to which metal flights are bolted. The chains are made of semi-heat-resisting alloy iron and the flights are of 18-8 stainless steel. The flights are perforated with ⅞-inch diameter holes to provide free circulation of the hot air. The conveyor chains run in guides the full length of the furnace, the guides being supported on brick piers running crosswise of the furnace. The conveyor, including flights, has an effective width of 5 feet. The internal length of the furnace is 18 feet.

The shoes are heated to a temperature of 900 degrees Fahr. in 60 minutes and held at this temperature for 20 minutes. This results in a final Brinell hardness number of approximately 260. A very careful hardness check is maintained. After drawing, the holes for fastening the shoes to the links are drilled. It is interesting to note that no other machining operation is done on the average shoe. In some of the shoes parts of the grouser, the vertical part of the shoe which digs into the soil, are cut away or relieved.

Links, shown in Fig. 2, are forged of SAE 1045 steel. They are received already forged and the first operation at the Caterpillar plant is annealing to relieve the forging stresses and refine the structure preparatory to machining. Annealing is done in the two gas-fired furnaces shown in Fig. 7. Links are pushed through the furnaces on trays 4 feet square. Each tray carries a load of 3000 net pounds. A push is made every 90 minutes, making the capacity of each furnace 2000 net pounds per hour.

Each furnace has five distinct zones. Based on a 90-minute push, the time in each zone in hours and the temperature in degrees Fahr. on leaving is as shown:

1—Preheat	1½	500
2—High heat and soaking	3	1550
3—Transition (very slow cool)	1½	1500
4—Rapid cool	1½	1250
5—Slow cool	6	850

Thus, total time of work in the furnace is 13½ hours. Heat is applied only in the high heat and soaking zone by means of high-pressure, 2-stage velocity burners using natural gas. The fast cooling zone is cooled by means of air forced through a number of alloy tubes located both above and below the work.

Loaded trays are advanced

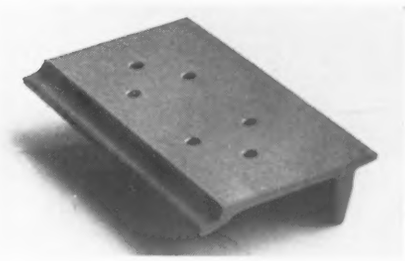


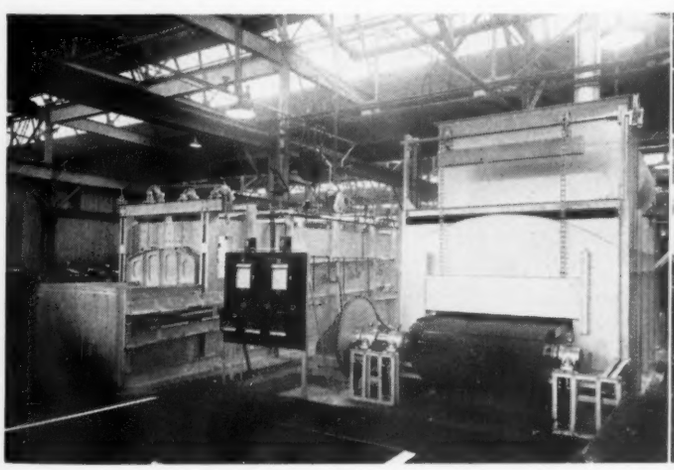
Fig. 3—Tractor track shoe of grouser type, rolled to shape from SAE 1045 steel and sheared to length

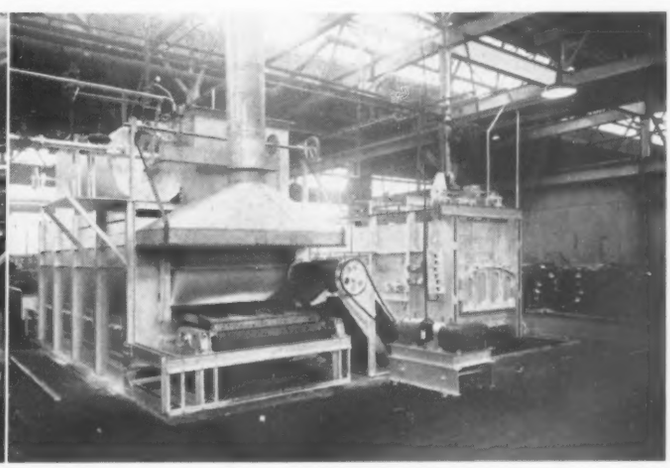
through the furnace on roller type rails by means of a rocker arm type pusher. The sequence of operations is essentially as follows: 1—A time clock raises the discharge door and operator removes a loaded tray onto the discharge platform; 2—Pusher advances 48 inches with four 12-inch intermittent strokes, advancing trays in furnace; 3—Discharge door closes automatically; 4—Charging door is raised manually, a loaded tray is pushed into the preheat zone over the disappearing dogs of the pusher and the charge door lowered.

Machining Follows

After annealing, the holes for the pins which fasten the links are reamed exactly to size, the two faces milled and the holes for attaching to the shoes drilled; all machining operations are done at this point. In the assembly of the links it is interesting to note that formerly each pin joining the links used to be fastened and held in place by a key. At present, due to closer control of heat treating, the pins are not keyed but are merely press-fitted. Allowable variation in the reamed hole is held to within plus

Fig. 4 (left) shows charge end of shoe hardening furnace at right and discharge end of drawing furnace at left. Fig. 5 (right) shows shoe draw furnace





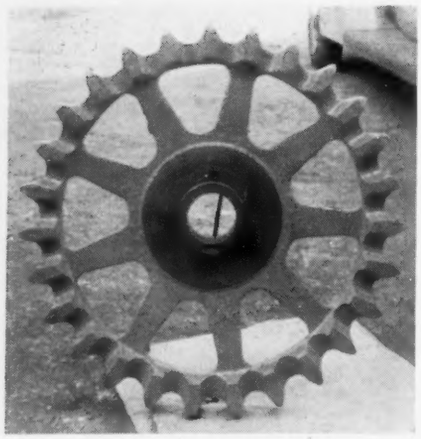


Fig. 6—Tractor drive sprocket is a steel casting with analysis similar to SAE 1045 steel

or minus 0.001-inch with an additional mean distortion of only 0.001-inch allowed in heat treating.

Distortion Minimized

Links are then heated for hardening and selectively quenched in a special fixture which minimizes distortion during quenching. In quenching, a spray is directed against the rail side of the link, the side over which the rollers travel, to form a hard surface on this face to resist wear, leaving the shoe side tough and strong. A drawing (tempering) operation follows which equalizes the quenching stresses and lowers the hardness slightly.

A typical sprocket is shown in Fig. 6. Sprockets are cast from steel having an analysis very close to SAE 1045 steel. While the sprockets are not cast at the Caterpillar plant, close control is maintained. It is required that an exact analysis of each heat of steel be submitted.

Fig. 7 (left) shows discharge ends of two furnaces used for annealing links. Fig. 8 (right) shows charge end of furnace in which sprockets are hardened

This analysis is sent to the metallurgical department and any slight variation due to foundry practice is compensated for by slight variation in the heat treatment. The metallurgical department determines the exact hardening temperature and length of quench so as to produce the exact physical characteristics desired regardless of any slight variation in the analysis of various heats when cast.

While all parts of each tractor receive very careful attention, the drive sprockets are given special attention. On each sprocket is cast the foundry heat identity. Before work is started on any sprocket a card is issued for the type sprocket from a given foundry heat. On this card is recorded the number of the sprocket, its heat number and the analysis of the heat, the temperature to which it is to be heated for hardening, the time it is to be quenched, and its drawing temperature. In the event of failure or excessive wear in the field, the card, which is kept on record, is analyzed in an attempt to determine the reason for short life.

Hardening First Operation

The first operation after receipt and acceptance from the foundry is hardening. This is done in the furnace shown in Fig. 8. This furnace handles sprockets up to 38 inches in diameter, weighing 383 pounds, and has capacity of 2300 pounds per hour, or six sprockets. Internal dimensions of the furnace are 8 x 25 feet.

The furnace conveyor consists of six alloy chains spaced on 15-inch centers. Each chain has a supporting surface 6 inches wide and returns within the furnace. The 38-inch sprockets travel through the furnace in two rows and are discharged at the rate of 6 per hour. Upon reaching the discharge end of the furnace the sprockets are deposited upon sloping rails, tripping a flag switch which lights a signal light advising the operator that a sprocket is ready. He raises the discharge door and pulls the sprocket out. There are two individual discharge doors, motor operated. Sprockets are skidded manually into a quenching press where they are firmly held to prevent distortion during the quench. Teeth and rim are then quenched, leaving the hub soft for later machining. Length of the quench is determined by the analysis of the steel.

Two-Stage Burners Used

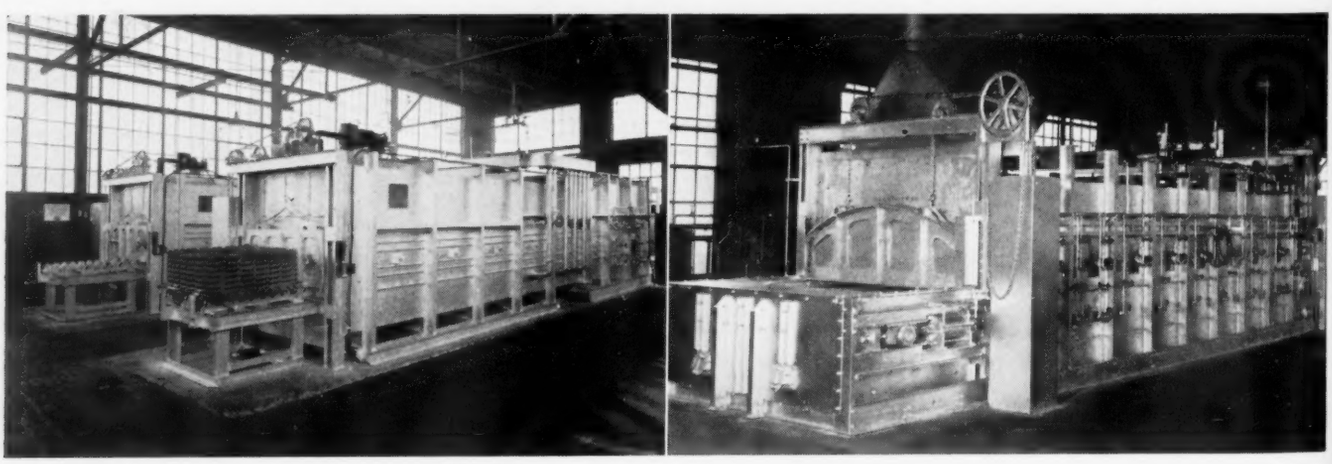
Heating of the furnace is accomplished by high-pressure, 2-stage velocity burners firing above and below the work. The burners are divided into three banks to give a preheating, a heating and a holding zone. Each zone is individually controlled. As quenched, the sprockets have a Brinell hardness number of approximately 525. They are subsequently drawn to 400 Brinell. After drawing, each sprocket is tested for hardness at two locations, 180 degrees apart. The hubs are faced and reamed and then splined for keying to the driveshaft.

Result of the painstaking efforts in the fabrication and, in particular, heat treating of tractor tracks is evidenced by the fact that many tractors working in black loam and other similar soils have traveled an equivalent of more than the distance around the earth on their original tracks. When the severe and varied stresses to which track is subjected are taken into consideration, this achievement is outstanding.

Adopts Rubber Wipers

■ Monarch Machine Tool Co., Sidney, O., has adopted the newly developed Duprene wipers for the carriage wings as well as the tailstock base of its lathes.

Wipers are fabricated of synthetic rubber composition and are not effected by oil, acid or other liquids and are claimed to last indefinitely.



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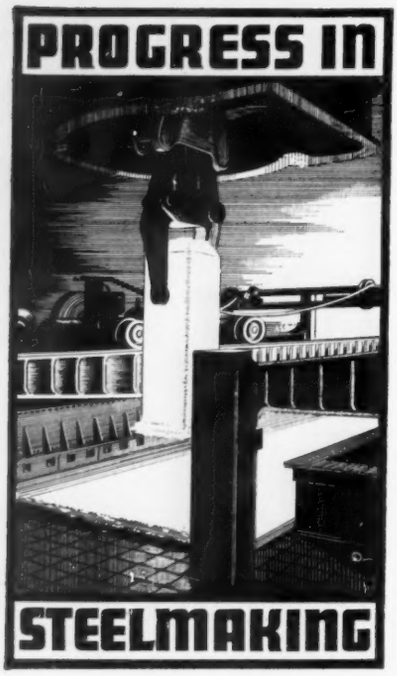


Gas Producer Pokers

These agitators now can be salvaged in the steel mill's welding shop by a new method involving replacement of worn ends with forged steel stubs and use of oxygen lance and welding

By R. P. PALMER

■ THERE WAS a time when the welding shop in a steel mill simply was a convenient place for small odd jobs and cutting orders, and a welding torch saw most of its service cutting scrap metal. Today the picture has changed, as no job is too big or too complicated for a well equipped and efficient welding department.

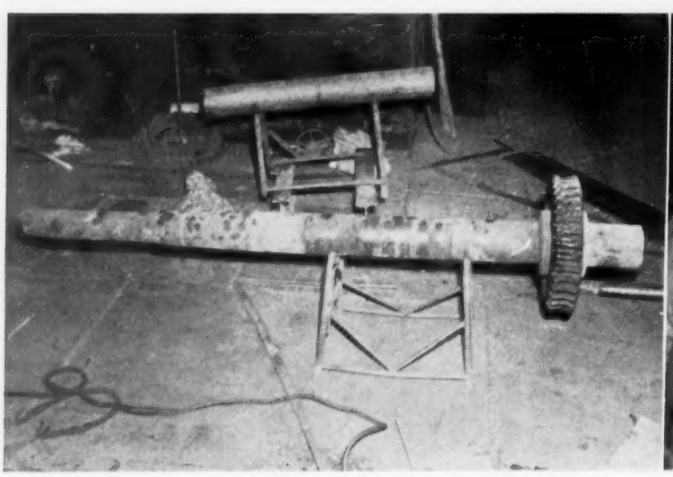
An example of what is being done at the present time in such shops is the repair of gas producer pokers, sometimes called agitators. They are used to stir the coal in producers making gas for the soaking pits. Each poker is 11 feet, 8 inches in length and 7 inches in diameter with one end bent to increase agitation. The gear on the other end is for revolving the poker. The producer also revolves and there are two pokers in each producer. The poker revolves about 12 times per hour and the producer itself about six.

One of the accompanying illustrations shows raised bearing shoulders at each side of the gear, also a hole in the end of the poker. This hole is 2 inches in diameter and extends the entire length of the poker except for 3 inches at the far end A copper or brass pipe, ¾-inch in diameter, is inserted throughout the length of the poker and goes to within 6 inches of the end to carry water to cool the poker. As the end of the poker in the coal is subjected to intense heat and abrasion, it must withstand considerable punishment.

In use, the end of the poker becomes badly worn for a distance of about 4 feet. Before the new repair method was developed, worn pokers were renewed by cutting off the worn end, welding on a good section from another poker and closing up the hole in the end with a weld, thus salvaging one poker out of two worn ones.

As an improvement over this method, a new end was forged and sent to the machine shop to have the hole drilled in the center. But this took too much time and was costly.

Now the job is done with an oxygen lance. The new stub consists of a piece of 7-inch shaft steel, 0.40



In foreground (left) is shown gas producer poker whose worn end is to be replaced with hollow stub shown in background. Stub is a 7-inch diameter, 0.40 carbon steel forging. It is set on special frame (right) which holds it at an angle, and hole for water pipe is cut with oxygen lance

THROTTLING solves many control problems

...involving heat treating temperatures

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3. **THROTTLING CONTROL**—Controllers use either air-operated or electric-operated valves.
4. **THROTTLING CONTROL WITH MANUAL RESET**—Available in the Potentiometer Controller, which uses electric-operated valves.
5. **THROTTLING CONTROL WITH AUTOMATIC RESET**—Stabilog type control provides throttling action, automatic reset, adjustment of fuel in proportion to rate of change, and all the functions needed to meet the most difficult control requirements. Available for all industrial temperature ranges and for use with air-operated valves.

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Certified TEMPERATURE CONTROLLERS

One end of stub is beveled and the other closed by welding. After the stub has been welded on the repaired poker is heated and bent to shape

per cent carbon, forged especially for poker use. It is set on a special metal frame shaped to hold the piece at an angle. After heating the center with a cutting torch, pure oxygen is applied through a long tube, rapidly burning a hole through the metal. Only 10 to 18 minutes are required to burn a hole through these 4-foot sections of forged steel. It then takes about two hours to work out the hole to a diameter of 2 inches.

One end of the stub is then beveled for welding while the other end is closed with a weld to a depth of 4 inches. Both the electric arc and oxyacetylene flame have been used with satisfactory results. After welding on the new stub, the poker is sent to the forge shop where it is heated and bent to shape. This heating tends to normalize the welds.

At one time, rebuilding the worn end before it became completely worn out was tried. This proved impractical, as it required so much more time than the present method that its cost was prohibitive. Also, it was a nuisance to dismantle equipment as long as it was operating satisfactorily. In addition, the poker had to be inspected frequently and removed for rebuilding when it was worn just a certain amount.

The new method described above has given excellent results, as the life of a renewed poker is as long or longer than that of a new one. The master mechanic likes the method because it makes a speedier job, saves money and makes it always possible to have spare parts on hand. The men in the weld shop are enthusiastic about it because they like to do work that shows such concrete reduction in time and expense.

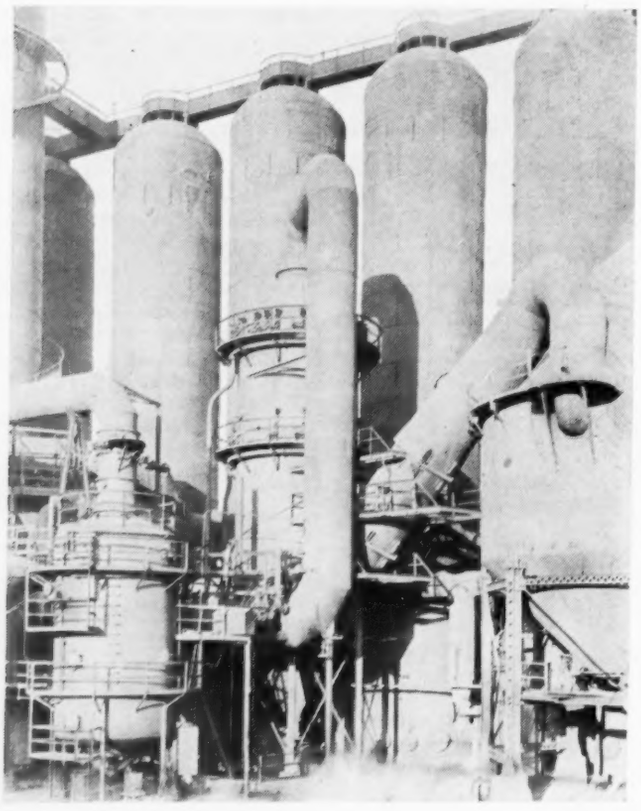
New Gas Washer Has Ceramic Tiles

■ A new gas washer operating in conjunction with No. 1 blast furnace at the Ohio works, Youngstown, O., of Carnegie-Illinois Steel Corp., has capacity to clean 75,000 cubic feet of blast furnace gas per minute. Of the spray tower type and constructed of ceramic tile, it replaces an old dry type gas cleaner.

The gas contains 6.75 grains of dust per cubic foot as it enters the washer from the dust catcher at the blast furnace. When it leaves the washer it contains only 0.115 grains of dust per cubic foot.

The gas enters the washer at the bottom and passes upward through a series of blanks of specially designed ceramic tiles and spray nozzles. Design of the tiles and arrangement of the tiles and spray nozzles are patented.

After leaving the washer, the gas is further cleaned when it passes through three parallel electric precipitators, each with capacity to clean 37,500 cubic feet of gas per minute. These precipitators further reduce the dust content of the gas to 0.02 grains per cubic foot.



At right, in front of line of stoves, is seen the dust-catcher through which the air first passes. In center is the spiral washer. At left is the first of three precipitators

New Furnace Enlarges Scope of Research

■ Of the 55 known metallic elements, only 15 have been extensively utilized. Study of the remaining 40 metals and their alloying characteristics is expected to open up new industrial uses. Such study will be greatly accelerated by a new furnace which has successfully heated metals without contamination up to about 4500 degrees Fahr.

Much higher temperatures are possible and only wait upon development of a crucible to withstand the increased heat.

Invented by Dr. R. H. Hultgren, metallurgist at Harvard university, Cambridge, Mass., the furnace consists of a small cylindrical crucible or metal cup made of tantalum, lined with thorium oxide and about ½-inch in diameter and height. In operation, the substance to be melted is placed in the crucible which is mounted between two filament wires in an air-tight cylindrical hood from which air is evacuated by a powerful vacuum pump. An electrical potential of 2500 volts positive then is applied to the crucible causing an electron flow from the filaments to the crucible. Kinetic energy of the electrons striking the crucible is converted into heat rapidly raising the temperature.

In tests, Dr. Hultgren has successfully melted iridium at 4230 degrees Fahr., platinum at 3200 degrees and palladium at 2790 degrees, indicating the present equipment can be used to melt all but six of the 55 known metallic elements, namely carbon, tungsten, rhenium, tantalum, osmium and molybdenum. Although electron bombardment has been utilized for intense heat before, this is its first application to metallurgy, it is said.

Small Gas-Fired Steam Boilers Find Many Uses

■ STEAM is employed in almost every industry for some process other than power. While some use steam from the main power plant, if one is present, many concerns employ small boilers according to their needs. Flexibility may be obtained by using several small units in the place of one large one. Efficiency is, or should be, the paramount consideration after capacity and the automatic gas boiler is undoubtedly among the first in this category. The automatic gas steam boiler is continuous in operation and constant as to steam pressure. It requires no attendance and is very compact. In fact the gas boiler can be classed as an automatic machine tool and has the added advantage that the raw material, gas, is fed to it automatically only when the finished product, steam, is being used and in exact proportion.

Probably the widest use for steam is the finishing department of manufacturing plants. Here the product is always cleaned, usually in a hot caustic solution and a hot water rinse followed by forced drying. In all three operations many employ steam from gas steam boilers as the source of heat although the direct application of gas is used by some.

In steel mills and forge shops pickling tanks may be heated with gas steam, either live or in coils, although live steam will dilute the acid bath and is generally the more wasteful method. Those factories in which some parts of the products they make are composed of molded plastic material, frequently use gas steam for heat and pressure in the molds although gas burners are also used for heating in combination with pneumatic, hydraulic, or mechanical pressure. Printing establishments, including newspapers, employ steam on the matrix tables in the photogravure process, and other places. Other industries using steam are legion such as chemical, dairy, cooking, baking, textile, electrical, laundry, rubber, to name but a few.

While the steam boiler may utilize any of the usual fuels or waste heat from other high temperature operations, the highest thermal efficiency is attained only with gas. The wide recognition of this fact has led to so many installations of gas fired steam boilers that this load forms a goodly portion of the industrial gas business. One big advantage the steam boiler fired with gas enjoys over those employing other fuels, is its automatic operation at a constant and high efficiency under wide variation in load. Its employment covers a wide range of uses including all low temperature heating operations and up to 350 degrees Fahr. and many operations requiring direct steam. The important problem, therefore, is the selection of the correct type, the best operating pressure and the proper size for each individual use. A great many boilers, otherwise fired, have been converted to gas firing by the insertion of a gas burner in the firebox and the addition of a steam pressure controller. This conversion is simply and easily accomplished.

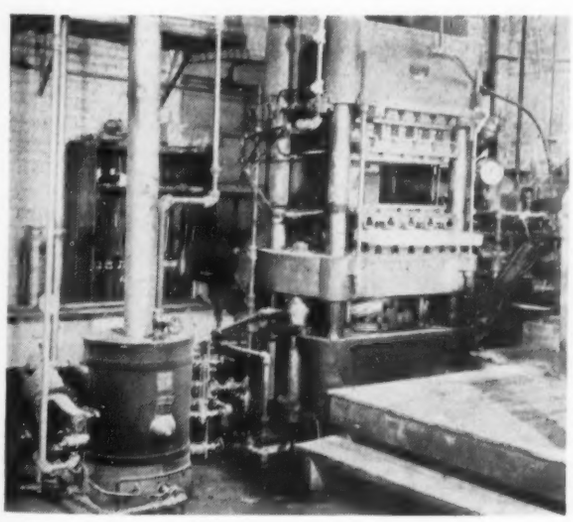
Small boilers are divided into two classes, cast iron for low pressure (15 lb. per square inch) and steel for high pressures. The latter can also be used for low pressures and the dividing line between the two is not very distinct but can be computed on a basis of economy and efficiency. Various designs of the different cast iron sections of the numerous makes of the first type are familiar to all. The tubular steel boiler is also well known in its varying forms of fire tube, water tube, vertical and horizontal. It is customary to supply automatic gas regulators with gas fired steam boilers to regulate the flow of gas to the burners in proportion to the volume of steam used, and these can be adjusted for any steam pressure. Once regulated the steam pressure in the boiler is thereafter maintained constant and without supervision regardless of the fluctuations in the volume of steam used.

Air Burner Employed

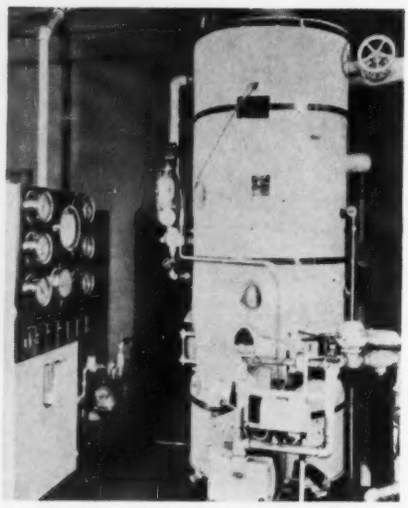
Gas burners employed are of the atmospheric type and are so designed that a large portion of the air required for combustion is taken in as primary air, through the burner mixer. The design permits the reduction of the amount of excess secondary air required to a minimum. While there are no grates in the fireboxes of gas boilers the horizontal cross area of the base at the level of the burner, is termed the grate area, when computing gas consumption. For every square foot of grate area approximately 225 cubic feet of manufactured gas or 120 cubic feet of natural gas is burned per hour. From 10 to 15 square feet of heating surface is required for boiler horsepower. This is average practice.

Great progress has been made in the very recent past in gas burner design. This has obsoleted some types of burners now in use. In these cases modern gas burners are installed and the customers satisfied. In one case such a conversion increased the capacity of the boiler approximately 40 per cent with an increase in efficiency of 5½ per cent.

While the size of the boiler required for any given heating operation can be easily computed this is usually unnecessary as the steam requirements of most jobs are known in advance and the different boiler capacities are a matter of rating by the manufacturer. However, it is important to select the boiler that will operate under the lowest pressure consistent with the work to be done. As an example we might take heating of solutions in tanks or kettles with submerged steam coils. Factors to be considered are boiler size, steam pressure,



Proper molding of plastics depends upon correct pressure, temperature and time cycle. Automatic gas steam boiler furnishes heat for platen press shown here



Shown here is typical gas fired steam boiler with automatic pressure regulator, low water gas cutoff and other devices

diameter and length of coil and a very close estimate of the probable cost of operation can be made in advance. A finishing plant, which uses chromium plating, can be cited as an example of an actual installation.

A chromium plating unit consists of several solution tanks, some of which must be heated. The process consists of nickel plating, acid copper plating, nickel plating again and then chromium plating. The work must be washed clean between plating baths. Temperatures in the cleaning tanks are maintained close to the boiling point while the chromium plating solution must be kept at 100 degrees Fahr. A chromium plating jobbing plant in New York City, doing work for large automobile concerns, steamship and motorboat builders recently put in a gas steam boiler to heat the tanks. Formerly underfired, radiation losses from those tanks were high and occasionally the bottom of the chromium tank would burn out from flame impingement.

Placed Where Needed

Today steam coils immersed in the tanks in this plant place the heat where it is most needed, flame impingement is eliminated and the bottoms as well as the sides can be insulated against heat losses. Quicker heating is another advantage.

Gas steam boiler used in conjunction with a double aperture nozzle forces a powerful jet of water on parts to be cleaned. Automobile chassis can be cleaned by this method in 8 to 10 minutes as against a full hour's time manually

From a cold start a boiler of this type (vertical fire tube) will steam in 40 minutes and during turndown periods it is possible to heat in five or ten minutes.

In line with machinery and products cleaning is automobile washing and "cold steam" has been developed for this. Such a unit consists of an automatic gas steam boiler and a two pipe nozzle which serves to mix steam and water. In this case steam at 150 pounds pressure is used with water in cleaning as steam alone is impractical. The steam forces the water against the work with considerable force. The water so cools the steam that the hand can be held in the jet as close as 18 inches from the nozzle. With this equipment a man can clean a chassis in from 8 to 10 minutes as against a full hour with the hand washing method. Paint removal is also easily done with this unit and numerous other applications will readily present themselves to the average factory manager.

Degreasing is another method of cleaning consisting of a tank of solvent which is vaporized with heat. The work is suspended in the tank, the vapor rising and condensing on it. The solvent then runs off, carrying the dirt and grease with it.

Heated With Gas

Many products are made completely or in part from molded plastic material. In fact this branch of industry has had a remarkable growth in the past few years. Here gas steam boilers are being used on an increasing scale. Proper results are dependent upon the correct pressure at a given temperature over a predetermined time cycle and as these presses are usually heated by steam the question of the best method of furnishing that steam is a factor of major importance here as elsewhere.

Plants with coal fired boilers used both for winter heating and process steam may be able to cut costs very materially by installing a small gas boiler to take the latter load in summer. Especially is this so when the heating load is considerably larger than the process steam load. An interesting example is that of a pharmaceutical manufacturer in Newark, N. J. The building is heated in winter with a 150 horsepower coal fired boiler. The process steam load alone is less than 3 per cent of the heating boiler rating and costs $12.57 a day in summer. This figure is made up at $5.52 for coal and $7.05 for labor in firing.

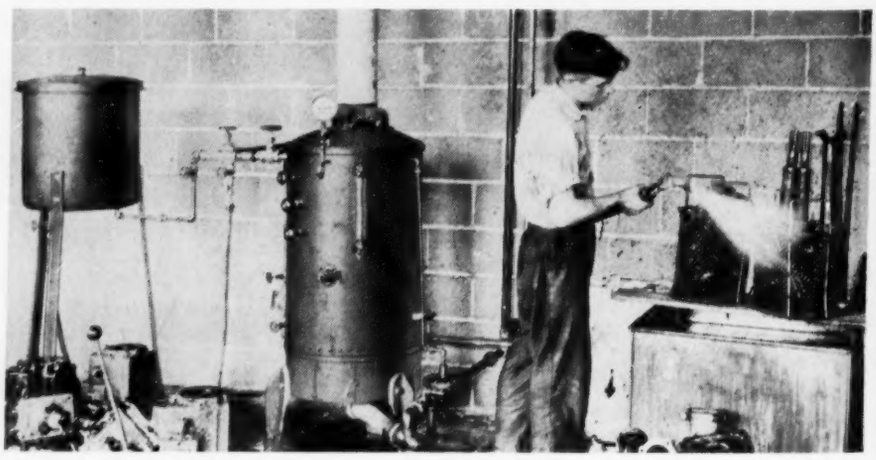
British Mechanical Data In 1938 Handbook

■ *Mechanical World Year Book*, 1938; cloth, 360 pages, 4 x 6 inches; published by Emmott & Co. Ltd., Manchester, England; supplied by STEEL, Cleveland; in Europe by Penton Publishing Co. Ltd., Caxton House, London.

Uniform with previous issues, this yearbook includes a new section devoted to electric arc welding. Development of this engineering process has reached the stage where details of application and the user's point of view are of importance. The new section describes the types and properties of electrodes, explains the welding process in detail and gives directions for various methods.

The plan adopted some time ago of alternating sections in successive editions is being followed, the aim being to provide in any two consecutive editions a larger store of data.

In accordance with this plan the section devoted to presswork, omitted in the 1937 edition, is included, with revisions to date and the metals and alloys section has been omitted, to reappear in a succeeding issue. All sections have been revised to include most recent developments.



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An EXCELLENT VIEW

Obviously it is not possible for us to promote your interest in Landis Type 30 Roll Grinders by placing one on your desk for inspection. An alternative is the photographic presentation on this page.

This view of a Landis 60" x 312" Type 30 Roll Grinder is a good one. It shows in miniature just what you would see if you were right out in the mill where it is used. Unfortunately we cannot picture the satisfaction of the user of this machine and the many others of like type now in operation.

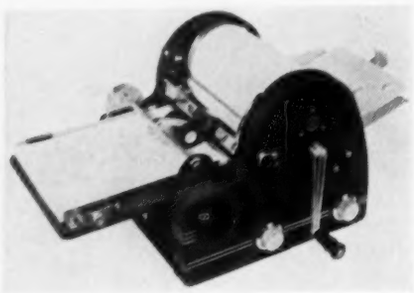
Our representative is anxious to tell you about this if he is given the opportunity. At the same time, he will discuss with you the reasons why the Landis Type 30 Roll Grinder is the choice of so many mills today. No. 250

LANDIS TOOL CO.
WAYNESBORO, PENNA., U. S. A.

NEW METAL PRODUCTS

■ Universal Battery Co., 3410 South La Salle street, Chicago, is about to place on the market its No. 630 Aerolectric charger, a wind-driven light and power plant embodying a considerable amount of steel in its construction. It is a 6-volt unit and charges 30 amperes. In addition to the new unit, improvements are being made on the 32 and 110 volt wind-driven plants.

■ Ditto, Inc., Chicago, has announced the Ditto model D-6 liquid process duplicator, a self-feeding and self-ejecting office machine that makes as many as 300 legible copies



from one handwritten, typed or drawn original. Of metal construction, the unit is modernly designed and claimed to produce 70 copies per minute. Reproductions in one or all of five colors are made in one operation.

■ Clemson Bros., Inc., Middletown, N. Y., has announced the packaging of its Star "Moly" hack saw blades in new metal boxes, replacing the cardboard containers previously used.

■ Dudley Lock Corp., 325 North Wells street, Chicago, recently placed on the market a new type cylinder lock claimed to be pick-proof and jimmyproof, and embodying use of more than the usual amount of steel in its construction. Extra long, double throw bolt has sawproof hardened steel pins. Hardened steel anchor pin-screw holds cylinder securely in lock case which is made of armor steel. Hardened steel box strike prevents jimmying.

■ Universal Crusher Co., Cedar Rapids, Ia., has placed on the market its 1938 model jaw crusher No. 1016 with base of special alloy, heat treated steel, eccentric shaft of forged chrome vanadium steel, rollers in a machined phosphor bronze cage, jaws of high quality manganese steel and toggle of hard cast iron.

■ International Nickel Co., 67 Wall street, New York, has announced the selection of monel for construction of storage tanks for a newly designed line of Ruud automatic gas, water heaters. The new gas heaters will be in five sizes ranging from 20 to 75 gallons and are designed for household, commercial and industrial hot water service.

■ Trane Co., La Crosse, Wis., has developed a new propellor fan constructed for quiet operation and high efficiency. Fans are built with four curved steel blades of large area set at an angle of 30 degrees with the plane of rotation. Curvature of the blades is so formed to insure the leading edges entering the air stream without a shock.

■ Mine Safety Appliances Co., Braddock, Thomas and Meade streets, Pittsburgh, is manufacturing a portable 4-gallon drinking fountain to supplant open dippers and buckets. New fountain is entirely of metal and both inner and outer jackets are of galvanized sheet steel.

■ Marmon-Herrington Co., Indianapolis, is manufacturing a new commercial track-laying tractor claimed to have speeds of 30 miles per hour and more. Hull is water-tight, per-

mitting the fording of streams of considerable depth. Truck or trailer is not necessary to transport the new unit to the job.

■ Sterling Machinery Corp., Kansas City, Mo., has a new lightweight self-priming pump with a heavy duty, 4-cycle, air cooled engine. The weight of only 55 pounds is obtained by use of aluminum alloys. With 1¼-inch suction and discharge, it handles 60 gallons per minute against a 10-foot head.

■ Hercules Steel Products Co., Galion, O., has developed a new dump body for dump trucks. It features an under-body spare tire and tool boxes with a new type center-lift hydraulic hoist and uses welded steel construction throughout.

■ Worthington Pump & Machinery Corp., Harrison, N. J., has announced a new line of pneumatic rock hammers with three-speed rotation to produce clean holes up to 20 feet in depth. A drop-forged retainer is used on all models.

■ Timken Roller Bearing Co., Canton, O., has announced new fuel injection pumps for engines from one to eight cylinders and in plunger diameters from 4 to 9 millimeters. All steel parts are made from special heat-treated alloy steels.

■ The Heil Co., Milwaukee, is building "Dig-N-Carry" scrapers of a new design in 5, 8 and 12-yard models. Features include use of welded steel construction throughout, low pressure pneumatic tires and hydraulic controls operating bowl, front apron and rear push gate.

■ Williams Patent Crusher & Pulverizer Co., St. Louis, Mo., has a new line of "Bear Cat" crushers equipped with heavy manganese steel hammers and manganese steel breaker plates. The front end is an electric steel casting. Cover liners are 1½ inches and side liners 1 inch in thickness.

■ Blackhawk Mfg. Co., Milwaukee, has announced a new hydraulic remote control unit similar in appearance to regular automobile transmission case and designed for operation of snow plows and other road equipment. It features a tapered steel handle that can be removed to prevent operation of pumps.

■ Wagner Electric Corp., 6400 Plymouth avenue, St. Louis, has placed on the market an improved line of integral-horsepower RG repulsion induction motors which are suitable for operating air compressors, viscous liquid pumps and conveyors.

Motors are available in both the vertical and horizontal types and from 1 to 3 horsepower. They have a high starting torque and low starting current.

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Montreal and Toronto, Canada, Drummond, McCall & Co., Ltd.

By ROBERT E. KINKEAD

On this page the author, well-known consulting engineer in welding is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL

Science and Technology Is Way to Human Progress

■ Several correspondents have inquired why this writer does not discuss the prevailing business recession on this page. We are under the impression that most of what appears here has a direct bearing on the job of creating and developing new jobs, new business and new wealth. Progress in technology whether it be welding, chemistry, electricity or something else contributes to the general good. And progress in technology is a definite, concrete and measurable fact. Science and technology are the only forms of human activity in which new principles are continually discovered and are therefore the only avenues along which the human race can progress.

Why should we discuss Mr. Roosevelt and his administration? Whether one chooses to call them statesmen or politicians, they have contributed to new principles to the art of government. Their racket is so old that the newspaper columnists can call the turns they will make two to three months before they make them. Nor do the principles of business change except as they are affected by technological and scientific discovery. The business man of today operates on identically the same principles as his counterpart of 2500 years ago. The fact that he uses a typewriter, telephone, airplane, etc. affects the speed with which he operates and the size of the institution he can manage, but not the principles of business.

But when Thompson discovered resistance welding, Goldsmitt the principles of Thermit welding, Slavinoff and Bernardos the principles of arc welding, Bournonville the principles of oxyacetylene welding wholly new possibilities of human activity and development were apparent. Add up the similar developments in the fields of science and technology and we have the sum total of human progress.

President Roosevelt and Messers Sloan, Young, Lamont together with Lewis and Green will not cure the recession no matter how earnestly they may try. Every single trick any of these gentlemen know is based on the unchanging principles of business or politics and has been tried many times with inevitable failure. Nothing will change except as a result of technological or scientific progress. To urge, to encourage, and within our small powers to compel such progress is the purpose of this column.

Experiments Dangerous But Are Necessary

■ Experiments of the Very Reverend Israel Harding Noe of Memphis in trying to sustain himself with spiritual food alone have proved dangerous.

He has lost his job and may lose his life.

The situation is not unique. Every man who experiments with new ideas in welding or anything else usually risks money, health and often life. The preponderance of opinion is against the experimenter with new ideas every time. Unless the searcher is willing to pay the price of going through with his experiments he will most likely not discover anything of value. The good Doctor of Divinity is playing for higher stakes than the first pilot who ever pulled a plane out of a power dive at 9-G, and is probably not much more reckless.

The welding industry, being as it is on the very verge of the greatest period of development in its whole history, needs men who will take risks involving reputation, financial return and health to explore new ideas. The era during which, in the welding business, men could make money out of money and be made big business men by the momentum of the business itself has rapidly drawn to a close.

The engineering public has grown up to the level set by the welding industry ten years ago. In spite of tremendous whooping up, the marvels accomplished by welding ten years ago are marvels no longer to the engineering public. They are accepted as a matter of course. The need is for new experiments to the end that still greater achievements may be recorded.

Welding Improves Crawler Shovel

■ Equipped with all welded boom and dipper stick, this crawler shovel was built by Link-Belt Co., Chicago, and sold to an Ohio company for strip mining use. Welded design has afforded greater strength and stability, while lessening weight 10 per cent and cost approximately 20 per cent. Hog rods were eliminated and use of a larger sheave permitted. Shielded arc equipment supplied by Lincoln Electric Co., Cleveland, was used in welding

New Method Eliminates External Flash on Welds

■ AS AN AID to efficient fabrication of steel tubes, what is said to be the first production line for electric resistance welding has just been installed by Cleveland Welding Co., Cleveland.

In the past two years this company has become a large manufacturer of bicycles. Recent perfection of a resistance welding process applicable to tubing, known as the Hart process, now makes possible production of strong joints without any external flash, thus eliminating grinding and sanding operations formerly required.

The new process is covered by United States patent No. 2,091,982 and other patents pending, rights to which are owned by Steel & Tubes Inc., Cleveland, subsidiary of Republic Steel Corp.

The Hart process consists essentially of three major steps: Reinforcing tube ends, preparing the tube ends for welding, and welding. To obtain maximum strength with light gage tubes, it is necessary to reinforce the tubes and provide greater wall thickness for the welds. When the tubing has a comparatively heavy wall, or when maximum strength is not necessary, reinforcing is not required. In the Hart method, the end of the tube is expanded slightly for a distance of 1 or 1½ inches by means of a punch. Into this expanded end a reinforcement is placed.

In bicycle construction this is generally a tube of about 14-gage material, knurled with a heavy cross knurl. After this reinforcement is in place, tube and reinforcement go through a die, which draws the tube end down over the knurled reinforcement to the original diameter in such a way that the knurl points are firmly imbedded. This makes a good mechanical and electrical connection between tube and reinforcement, provides a heavy wall for welding, and distributes the stress away from the actual joint. In production this reinforcing is done automatically by a machine developed by Taylor-Winfield Corp. and shown in Fig. 2. Tubes to be reinforced are placed in a rack and reinforcements loaded into a hopper.

In operation a tube drops into guides and is moved forward through a die, then an indexing mechanism carries it forward one station, in which position a punch expands the end of the tube. In the next position a second punch places an insert in the expanded end of the tube. Then it is indexed to the third station where a plunger forces tube and reinforcement back through a die, drawing the tube down to the original diameter. Indexing is controlled by a Geneva movement. A single hydraulic ram actuates the three punches so that all three operations are performed simultaneously, each stroke producing one finished reinforced tube end.

Second step in the Hart process is to machine the reinforced tube end to make a line contact at the inner edge of the tube only, leaving a small wedge-shaped space extending away from this line contact to the outer edge. This contour is made with a high speed form milling cutter in a semiautomatic machine. Fig. 5 shows this milling machine set up to mill both ends of a bicycle frame, brace bar.

With the tube in position, pressing a button actuates air operated clamps and at high speed moves up the two milling heads almost into contact. A slow feed then au-

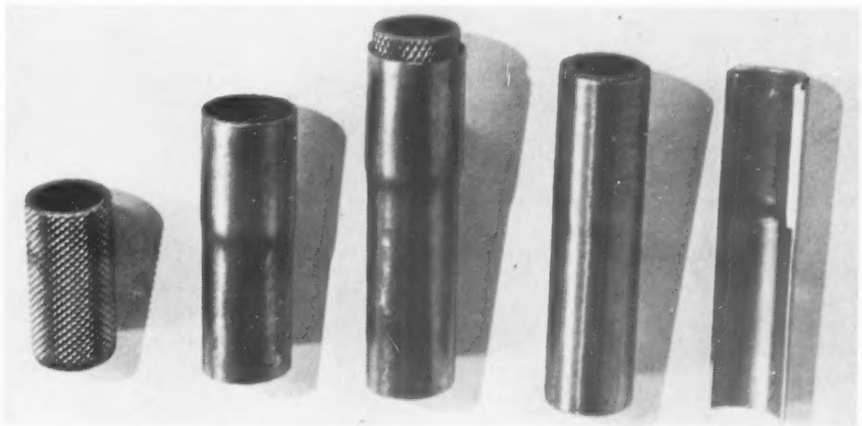


Fig. 1—From left to right, knurled reinforcement, tube expanded, reinforcement inserted, tube drawn down over reinforcement and a completed section

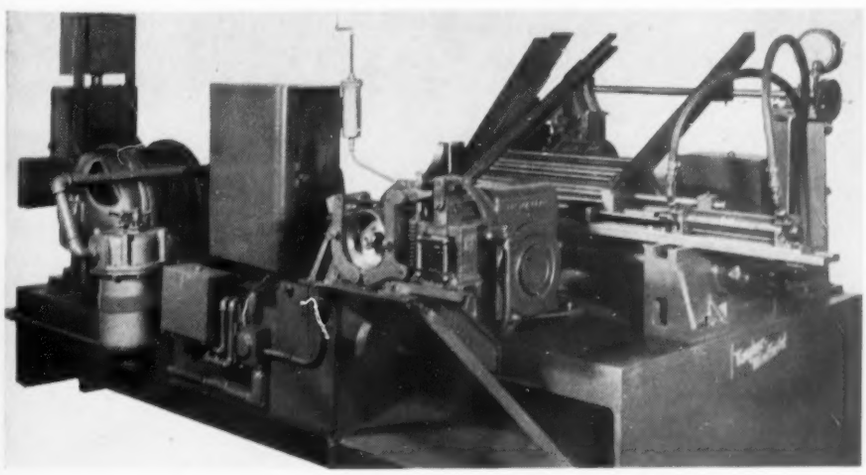
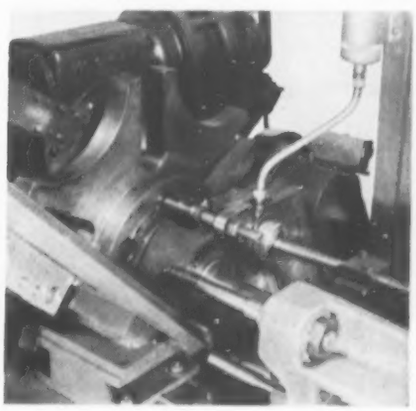


Fig. 2—Automatic tube reinforcing machine—2700 finished pieces per hour

Fig. 3—Reinforcing machine close-up showing geneva movement and hydraulic ram with three punches



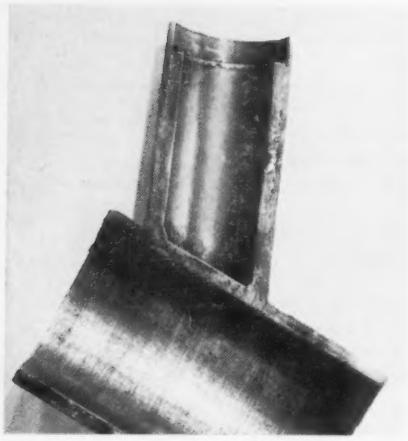


Fig. 4—Cross section showing complete fusion of parts

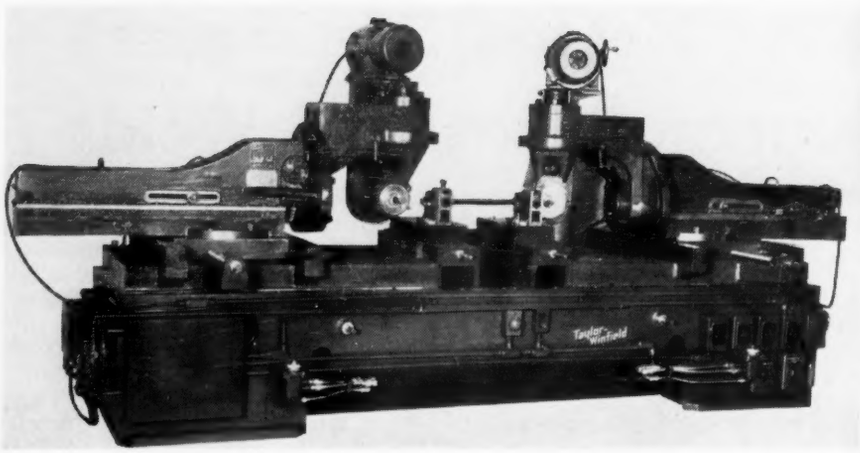


Fig. 5—Semiautomatic milling machine, set up to mill bicycle brace bar

tomatically controls actual milling, at the end of which both heads return and the clamp opens. This machine can mill approximately 700 ends per hour and can be set up to handle a wide variety of work.

Third step in this process is to bring the machined tube end in contact with the other article under heavy pressure and apply a high current for a short time forming the weld. In bicycle construction approximately one or two tons pressure, 150 to 250 kilovolt amperes and 4 to 10 cycles of a 60-cycle current are employed.

This work is done in press welders shown in Fig. 8. A crank hanger tube is placed over a horizontal mandrel, and the tube to be welded to it is clamped vertically by Elkonite-faced jaws directly under the mandrel. When in position a button is pressed and a small horizontal air cylinder locates vertical jaws on the centerline. Another air cylinder clamps the vertical tube by means of a toggle. Air is then admitted to the cylinder near top of the machine and the roller bearing head comes down, applying pressure. Current is turned on by an electronic control for the desired length of time and the cycle reversed. This entire cycle occupies from 2 to 3 seconds depending on the type of joint being made.

An Ignitron timer makes intervals from 1/120 second to ½ second or longer available. Two Ignitron power tubes, each conducting current in only one direction, close and interrupt the welding current.

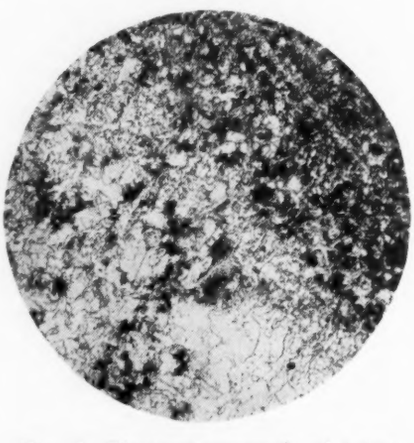


Fig. 6—Photomicrograph of joint in Fig. 4

A heat control also is supplied which works with the power tubes so that welding current can be varied from 20 per cent to maximum by setting a small dial, providing a smooth, stepless current adjustment.

Welds made by the Hart process have no upset or flash outside of the joint and so require no finishing. Fig. 7 shows two such joints as they came from the welder. Exhaustive tests in bending, in tension and under vibration indicate a joint stronger than the tube. Repeated destructive vibration and actual road tests made on complete bicycle frames have demonstrated ample strength.

Fig. 4 is a macrograph of a head joint showing the complete fusion of outer tube, reinforcement and cross tube. Change in grain structure is at minimum due to rapidity with which the joint is made. Fig. 6, a photomicrograph of the joint in Fig. 4, shows complete fusion of the three parts with very limited change in grain structure.

The Hart process is a machine process in every stage. Reinforcing, milling and welding operations with automatically controlled timing, pressure and current produce consistent results since variables due to the human equation have been eliminated.

Fig. 7—Crank hanger joints made without external flash

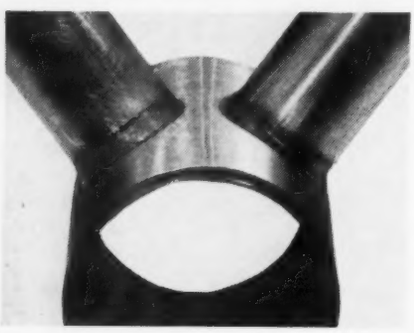
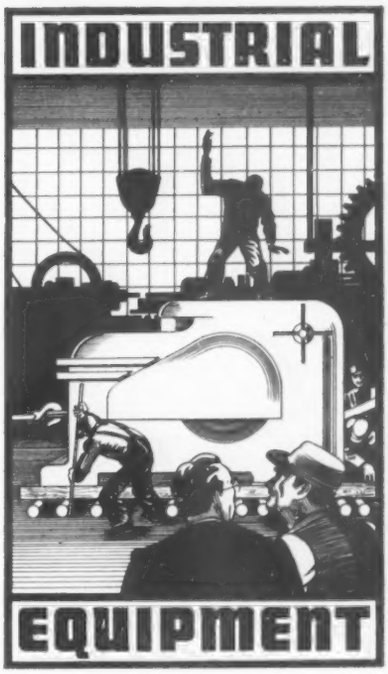


Fig. 8—Production line, welder at left making head joint; welder at right making seat part joint

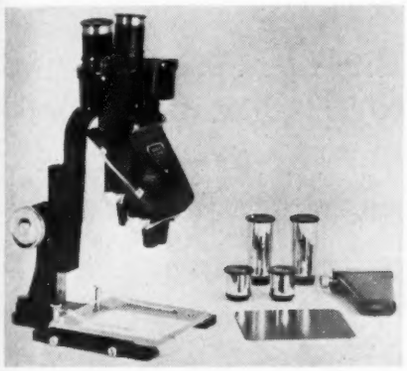


Microscope Equipped With Dustproof Nosepiece

■ Bausch & Lomb Optical Co., Rochester, N. Y., has introduced a model K wide field binocular microscope which is useful for usual low power work. Unit is lighter and smaller than the Greenough type.

Microscope is available for either reflected or transmitted light. Both are supplied with objectives and eyepieces to cover the general range of shop and school work. A feature of the instrument is the dustproof shuttle nosepiece which carries any two pairs of objectives in parfocal position, except the 0.39X and 0.7X objectives. The full range of objectives and eyepieces is available for working magnifications of 2.34 to 150 diameters.

Body of the instrument is the same as the Greenough type, adjustable for interpupillary distance. Stage of the unit is equipped with removable glass insert and removable black and white metal plate. This permits proper contrast of the object under observation. Microscope can be placed directly on the work or it can be equipped with a base carrying a fork-mounted mirror for transmitted light, and a pair of arm rests to steady the hands while handling the object.



Stage of this Bausch & Lomb microscope is equipped with removable glass insert and removable black and white metal plate to contrast object under observation

Pumping Unit Built For Bulk Transfering

■ Worthington Pump & Machinery Corp., Harrison, N. J., has introduced a pump unit for bulk transfer service where both thin and highly viscous liquids are handled.

Unit is of the herringbone-gear impeller type driven by a motor or internal combustion engine through a 2-speed, enclosed transmission. The pump may be operated at high speed for light liquids, and at a slightly reduced speed for viscous liquids. In both cases the full power of the prime mover is employed.

In conventional applications of single pumping units, motors are selected for the heaviest loads and operated at a fraction of their rated power when pumping the thinner liquids. Unit is compact, requiring little space. No valves are embodied to retard the liquid flow.

Journal Bearings Take Thrust Loads

■ Fafnir Bearing Co., New Britain, Conn., has introduced combination ball and roller journal boxes which are being used in high speed trains. According to the manufacturer, these boxes are the only antifriction boxes which include high capacity thrust ball bearings to take the thrust loads imposed on high speed curves.

The unit permits free lateral axle movement and is easily assembled for wheel changes. Radial load is carried on hardened solid rolls. Alloy housing is hardened and reversible for double wear. Unit is also insulated with a heavy rubber pad which improves the ride and deadens noise. The simplified construction of these boxes also permits easy installation on trucks and axles of present equipment, it is claimed.

Tiering Trucks Have Telescopic Platforms

■ Clark Tructractor division of Clark Equipment Co., Battle Creek, Mich., has introduced a new line of gas-powered lifting and tiering trucks which can carry a 3-ton load from 1 to 9 miles per hour and elevate it to 102 inches in 30 seconds for tiering.

Truck includes a 3-ton platform telescopic trucktier. It has a platform 28½ x 54 inches that can be inserted under any load having 11 inches under-clearance. Rear drive wheels of the truck have 20 x 5-inch tires and the forward platform wheels have tires 10½ x 7 inches in size. Unit is powered by a 6-cylinder, tractor type engine with a self-starter.

Four-wheel steer of the truck is operated by a vertical hand wheel on

Platform of this Clark gas-powered tiering truck elevates loads 102 inches in 30 seconds and carries a 3-ton load from 1 to 9 miles per hour

the dash. Brakes are foot-controlled and set automatically as driver steps off the platform. The machine can turn around in the intersection of two 64-inch aisles.

Collapsible Tap Is Fabricated of Steel

■ Landis Machine Co., Waynesboro, Pa., has introduced a 3ALM receding chaser collapsible tap to its present line of taps which was designed primarily for the tapping of couplings but can be applied to any machine employing a live spindle and where the re-setting action is done automatically.

Tap is fabricated of high carbon steel and all parts are heat treated and precision ground. Internal mechanism is similar to the standard IM tap in that it employs a cross slide cam to control it. It is possible to trip the tap at any position by merely adjusting a tripping bar so that it contacts the tripping button located in the body of the tap near the shank end. Adjustment is provided for taper change and for taper correction.

Landis 3ALM receding chaser collapsible tap employs a cross slide cam to control the taper. It may be tripped at any position by adjusting tripping bar

Tap may be used for any taper of thread ranging from 0 to ¾-inch taper per foot and may be changed gradually. To change taper or to adjust for a slight error, it is only necessary to release locking screw in the control collar and move taper indicator.

Cutting coolant is admitted to the tap through a bronze yoke ring located at the rear of the control collar into the hollow tripping ring through tripping ring supports which are also hollow. Face plate of tripping ring is perforated with a series of small holes so located that the entire volume of coolant is directed within the coupling.

Tap is fully enclosed eliminating the possibility of chips or dirt entering to cause excess wear to the working parts.

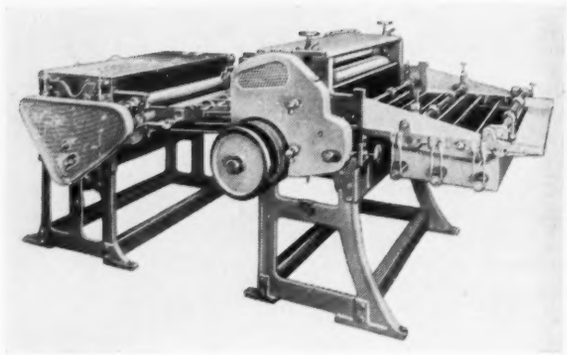


Illustration shows first the oiling machine and then the wiping machine which are rigidly constructed as one continuous unit

Sheets Simultaneously Oiled On Both Sides

■ Charles Wagner Litho Machinery Co., division of National-Standard Co., 51 Park avenue, Hoboken, N. J., has introduced a combination oiling and wiping machine designed to oil both sides of a sheet simultaneously and is equipped with an adjustment that controls the amount of oil film to be deposited.

Unit has two steel oiling rollers 9 inches in diameter. Each are fed from an oil reservoir through a set of fountain and distributing rollers. A rotary pump keeps the reservoirs supplied. Sheets leaving the oiling rollers pass through a pair of oil proof squeegee rollers.

Three gas heaters heat the sheets before entering the oiling rollers in order to open the pores in the metal. The two steel rollers may also be heated to allow the heavy oil to flow easily. These rollers are equipped with swivel couplings for hot water or steam connections, if desired.

A pair of squeegee rollers are located at the front of the wiping machine. Sheets leaving the oiling unit squeegee rollers pass through the wiping machine squeegee rollers and then through the wiping rollers. Wiping rollers are covered with carpet and vibrate in both directions, thereby rubbing and wiping the superfluous oil into the plates on both sides and producing a clean sheet with oil left in the pores of the metal. An adjustment on the rollers enables operator to produce oiled sheets with any film thickness.

Constructs Machine To Test Metal Hardness

■ Herman A. Holz, 167 East Thirty-third street, New York, has placed on the market a Reflex-Vickers type machine constructed for hardness tests of metals and metal products from the very softest to the hardest of metals.

Ground glass in this Reflex-Vickers metal hardness testing machine serves to reflect the image of the indentation and facilitates the correct performance of the test

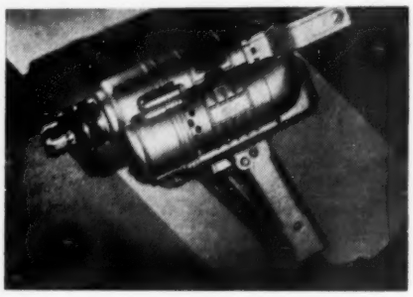
Results are obtained by the use of a square-sided diamond pyramid of

136 degree angle, giving geometrically similar indentations independently of load applied. Measurements are taken from the distances of opposite corners of the square impressions, these distances being more than five times as large as corresponding depth values of cone impressions it is claimed.

By moving the small crank at the side of the unit, the greatly magnified image of the square diamond impression appears automatically in the machine in front of the operator after testload is lifted. Entire mechanism is fully protected against dust and accidental damage. According to the makers, the same machine can be used with small steel balls as indenters and if the correct ratio betweeen load and ball diameter is applied test results will be standard Brinell units. Maximum height of testpiece is 11.8 inches. Distance from indenter to machine frame is 5.9 inches. Unit weighs about 300 pounds.

Heavy Duty Drill Is Half Its Former Size

■ Independent Pneumatic Tool Co., 600 West Jackson boulevard, Chicago, has placed on the market a



This Thor U44 ½-inch electric drill is said to drill a ½-inch hole 2 inches deep in a piece of steel in one minute when sufficient pressure is applied

Thor U44 electric drill which is said to be reduced in weight and size to half the former standards for ½-inch drills.

Drill is a heavy duty tool designed for continuous service. It weighs 9 pounds and is 12 inches in length. Streamlining of the drill has made it possible to be used in places formerly inaccessible, it is claimed. This design is said to allow great pressure applied to the handle without danger of throwing the armature out of alignment.

Standard equipment includes ½-inch Jacobs chuck, spade handle, lever type side switch handle that can be locked and 10 feet of molded rubber cable with ground wire. A keyless chuck may be supplied. Spindle and lower armature bearings are sealed tight so grease cannot enter field case from gear case or be thrown out around spindle. Upper armature bearing is also sealed in grease. Field case, handles, center plate and gear case are die cast from aluminum alloy. Gears and shafts are made from hardened and ground alloy steel.

Switch, which is enclosed in the safety lever handle, is of the 2-pole type and wrapped in fibre sheet for double protection against grounds and shorts. Trigger switch is conveniently located and provided with a lock so it can be used either as a safety switch or snapped on and off. Armature is made from hand formed coils which are separately wound with triple insulation. Lamination has U shaped slots which provide the extra room for this insulation. Commutators are mounted on a brass sleeve and locked with a threaded brass nut allowing uniform expansion and contraction caused by heat.

Explosion-Proof Motors Conform To Standards

■ Reliance Electric & Engineering Co., 1038 Ivanhoe road, Cleveland,

The molten metal bath which you give your product, while usually the *last* stage of processing, is essentially *first* in protective importance and therefore should be selected from both a *practical* and *economical* worth. This *NEW* DRY BLANKET COVERING for molten metal baths of zinc, lead, tin and their alloys, has been scientifically prepared to effect these advantages:

G. B. 412 GALVANIZERS' BLANKET

Prevents loss of heat by radiation.. Saves 35% to 50% of fuel... Prevents oxide formation... Safe to handle... Easily applied.

Further information and complete proof of its economy will be mailed upon application.

GRAY CHEMICAL COMPANY ROULETTE, PA. (Potter County) Phone Roulette 2131

FORTY YEARS OF SUCCESSFUL SERVICE

has placed on the market a line of explosion-proof, squirrel cage alternating-current motors with mounting dimensions conforming to National Electric Manufacturers association standards.

According to the fabricators, these motors have been tested and approved by Underwriters' Laboratories for hazardous locations which include those in which flammable volatile liquids, highly flammable gases, mixtures or other flammable substances are made, used or stored in other than original containers. Construction of motors is such that all working parts are completely enclosed, and housing strong enough to withstand an internal explosion without bursting, loosening joints or permitting flame to escape into the outside air. Motors are integrally cast and known as type AA.

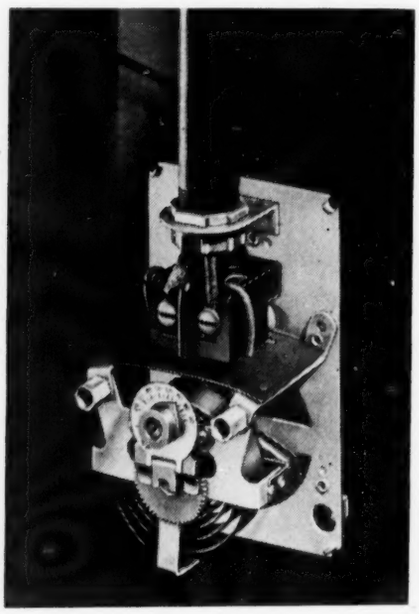
Hydraulic Press Used as Lifting Jack

■ Bucyrus Erie Co., South Milwaukee, Wis., has introduced a portable Beco hydraulic press which can be used either as a puller, press or jack. The press is made for use on heavy machinery to press large gears on shafts, pull bevel pinions, drum shaft gears and press work on shovel gears, spiders, sprockets, shipper shafts and track mechanism.

Unit may be used as a jack up to 150 tons capacity. When used for this kind of work, a compact press cylinder weighing 75 pounds is used to do the lifting. It can be set up in any position. Frame for press work weighs 310 pounds.

Switch Control Enclosed

■ Jefferson Electric Co., Bellwood, Ill., has introduced a tamper proof air switch control which is fully enclosed in a metal case and cannot be adjusted without removing same. Control knob, scale plate and range adjustment are all incorporated inside the unit.

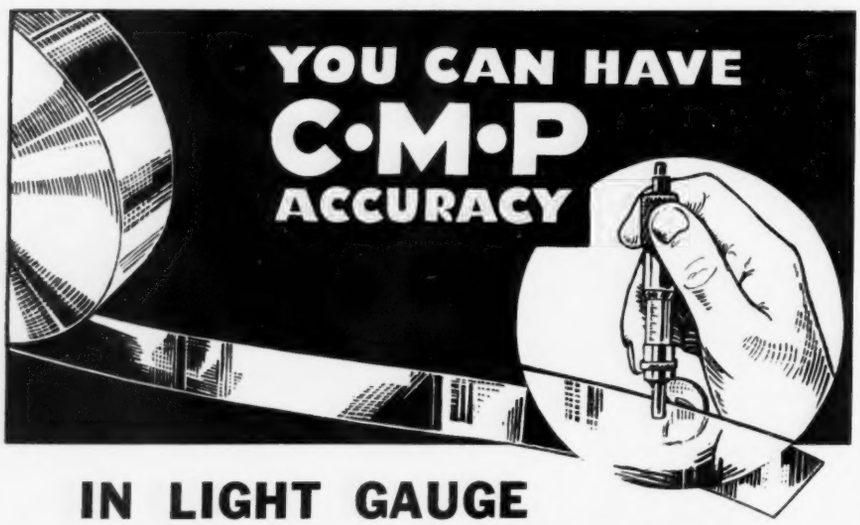


Interior view of Jefferson air switch control. None of the control devices shown protrude from the metal case which fully encloses the unit

Valves Are Designed For High Pressures

■ Crane Co., 836 South Michigan avenue, Chicago, has placed on the market iron body Globe and angle valves which are designed for 150-pound working pressure, and 300-pounds on cold water, oil or gas lines.

Valves are equipped with plug type discs which are made of nickel alloy. Body seat ring of the valves are made of Exelloy, a heat treated chromium iron. Stuffing boxes are fitted with a gland and filled with packing which may be replaced while under pressure.



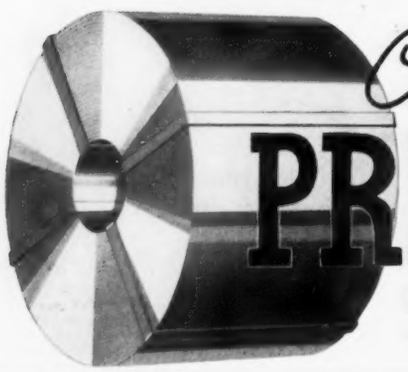
IN LIGHT GAUGE STAINLESS STRIP STEEL

Carbon grades of Cold Rolled Precision Strip Steel are widely known for their close limits of gauge accuracy over the complete width and length of the strip. They are more true to gauge than standard specifications and this feature is called "C.M.P. Accuracy."

Now, you can obtain stainless steel strip with C.M.P. Accuracy in any regular analysis and temper, in the largest coils you can handle and in gauges as light as .001".

C.M.P. Accuracy costs no more than standard tolerances but it gives you greater value. It assures more uniform production and more output per hundred pounds of metal. With stainless steels, these advantages are obviously of great importance.

The Cold Metal Process Co.
YOUNGSTOWN, OHIO



Cold Rolled PRECISION STRIP STEEL

Steel Distributor Has Unusual Facilities

(*Continued from Page* 56)

the warehouse, Robert Abel Inc., Boston, supervising.

With the new addition, the Bancroft warehouse is approximately 500 feet long and 65 feet wide, giving a total of 32,500 square feet of floor space. In addition to outside tracks, a switch track now runs directly into the center of the new portion at one end. All incoming carloads in box cars are received on the longer outside tracks and unloaded. The inside line is used for receiving and unloading sheet packs wrapped in waterproof paper and shipped in gondola cars.

These incoming sheets are unloaded and handled onto storage piles by means of the cranes and lifters. Scales are provided at both receiving points. Previous to the installation of the overhead cranes, much of the lifting was performed by portable cranes, one of which still is used for odd jobs. Material received in box cars is unloaded by hand on skid platforms, which then are transported inside the warehouse by hand lift trucks.

This warehouse distributes to customers in all parts of New England as well as to the New York territory. Most outgoing shipments are by motor truck loads, by cranes, lift trucks and skids. A recessed loading dock with a capacity for three motor trucks is located on the side of the building opposite the outdoor receiving tracks. This recessed space also provides garage facilities at night for the company's own trucks.

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Writes of Industrial Unionism in Action

■ *CIO, Industrial Unionism in Action,* by J. Raymond Walsh; cloth, 293 pages, 5½ x 8 inches; published by W. W. Norton & Co. Inc., New York; supplied by STEEL, Cleveland, for $2.50; in Europe by Penton Publishing Co. Ltd., Caxton House, Westminster, London.

The author, formerly associated with the department of economics of Harvard university, gives an account of the history, aims and leadership of the CIO in relation to the past and present of the American labor movement as a whole. Previous efforts to build industrial unions in this country are described and reasons given for their limited success. The author examines in some detail the effect of CIO on stability of the national economy and discusses implications for the political and cultural life of the country.

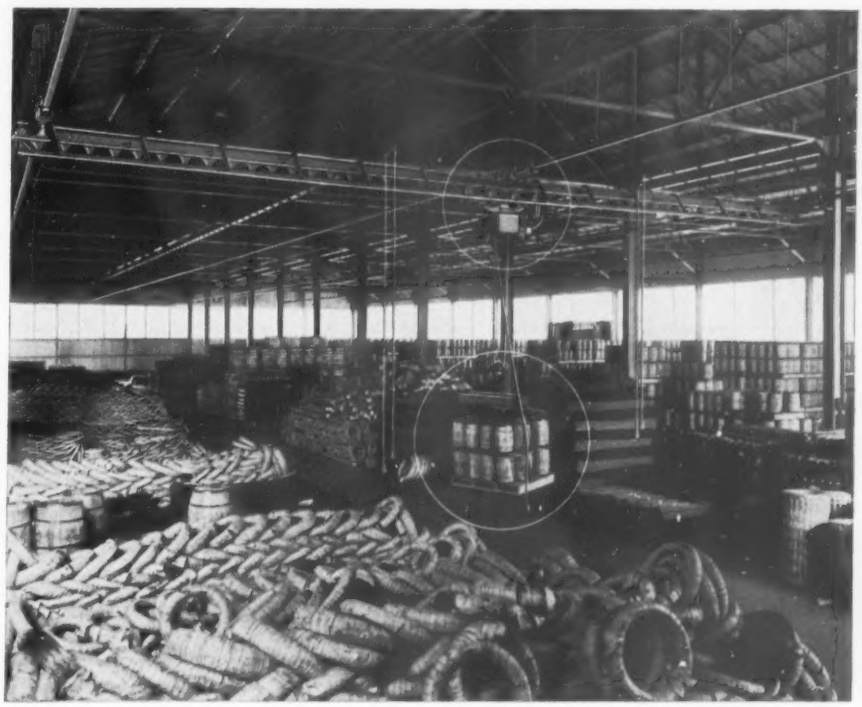
Hose Operated by Remote Control Valve

■ To provide protection against freeze-ups and loss of water through leaky piping, Rockwood Sprinkler Co., 38 Harlow street, Worcester, Mass., has designed a remote control hose valve which is rapid and can be quickly put into service in case of fire.

Remote control valves are used in conjunction with a main valve which controls flow of water from the main source of supply. Main valve is generally located where there is heat throughout cold weather. Remote control valves are located at various points throughout the property, thus piping between main valve and remote control valves is normally empty, preventing loss of water in case of leaking pipes. Upon receiving an impulse from the main valve, remote control valves operate at once supplying water where required in a few seconds. As there is no water standing in the pipes, danger of freezing during cold weather is eliminated.

CLEVELAND TRAMRAIL

MATERIALS HANDLING EQUIPMENT



● Another Tramrail Transfer Bridge installation—this one—48′ span - 3 runway; all motions of bridge, carrier and hoist are motorized and floor controlled through push buttons and contactor panel.

ALSO BUILDERS OF

CLEVELAND CRANES

FOR EVERY INDUSTRY

CLEVELAND TRAMRAIL

Division of

THE CLEVELAND CRANE & ENGINEERING CO.

1125 Depot St.

WICKLIFFE, OHIO

Or consult your phone directory under Cleveland Tramrail.

RECENT PUBLICATIONS OF MANUFACTURERS

Copies of any of the literature listed below may be obtained by writing directly to the companies involved, or by addressing STEEL, in care of Readers' Service Department, 1213 West Third Street, Cleveland

Cutting and Threading—Curtis & Curtis Co., Bridgeport, Conn., has published a catalog featuring its pipe-cutting and threading machines. The catalog contains illustrations, technical data and specifications.

Gages—Ashton Valve Co., 161 First street, Cambridge, Mass., has published a 32-page illustrated catalog devoted entirely to its gages and accessories. Specifications and engineering data are included.

Apprentice Graduates—Brown & Sharpe Mfg. Co., Providence, R. I., has issued a 2-color bulletin containing pictures of the apprentice graduates connected with the company during 1937. Pictures of some of the company officials are also included.

Respirators—Mine Safety Appliances Co., Braddock, Thomas & Meade streets, Pittsburgh, has issued a leaflet describing and giving specifications on its new Dustfoe respirator which has been approved by the United States bureau of mines.

Valves—Hancock Valve division, Manning, Maxwell & Moore, Bridgeport, Conn., has available the first bulletin ever printed describing its blow-off valve with the Blo-Deflector. The bulletin, No. 8500, contains specifications, illustrations and technical information.

Air Circulation—Swartwout Co., 18511 Euclid avenue, Cleveland, has issued bulletin 205 embodying design and capacity information on its rotary ventilators. Besides illustrations and technical data the bulletin contains tables on wind velocity and temperature factors.

Joints and Shafts—Mechanics Universal Joint division, Rockford, Ill., has published a catalog embodying information regarding its joints and flexible drive shafts for industrial applications. Catalog contains illustrations, specifications, graphs and technical information along with lubrication instructions.

Tempering—Leeds & Northrup Co., 4901 Stenton avenue, Philadelphia, has released a folder entitled, "Tempering As Jacobs Like It." The folder gives the more important details in Homo tempering of machine-tool chucks and a brief description of the furnace involved. Illustrations and specifications are included.

Safety Helmets—W. W. Sly Mfg. Co., Cleveland, has released bulletin S-81 containing a description of its Purair helmet which protects workmen from inhaling injurious dusts and fume-laden air. Specifications are also included.

Roll Grinders—Landis Tool Co., Waynesboro, Pa., has available catalog V-37 on its type 30 grinders which are designed to grind the larger hot and cold sheet and plate rolls with either straight, concaved or crowned bodies. Catalog contains illustrations, specifications and some engineering data.

Pyrometers—Bristol Co., Waterbury, Conn., has issued bulletin 493 describing potentiometer pyrometers recorders and controllers. Embodied is a description of the Pyromaster and its use in conjunction with a resistance thermometer, tachometer and millivoltmeter. Illustrations are also included.

Metal Spraying—Metallizing Engineering Co., 44 Whitehall street, New York, has released a booklet entitled "Metal Sprayed Surfaces in Relation to Lubrication." The booklet was written by Harry Shaw, consulting and research engineer. It contains charts, and technical data along with other information.

Abrasives—Abrasive Co., Tacony and Fraley streets, Philadelphia, has published an illustrated bulletin on centerless grinding wheels for production work with particular reference to the K bond borolon vitrified wheels, and containing a general recommendation table in terms of abrasive wheel markings. Included are also reports of specific applications.

Wire Ropes—Broderick & Bascom Rope Co., 4203 North Union boulevard, St. Louis, has issued a new handbook containing much information about wire rope slings and fittings with directions for splicing and socketing wire rope. The booklet also contains illustrations, specifications and tables.

Pyrometers—C. J. Tagliabue Mfg. Co., Park and Nostrand avenues, Brooklyn, N. Y., has available a 29-page catalog No. 1101-D which contains the whole line of recording instruments manufactured by the company. Catalog embodies illustrations, technical information and specifications of the various instruments. A price list is also included.

Metal Windows—Mesker Bros. Iron Co., St. Louis, has issued two publications concerning metal windows. One publication entitled, "Concentrated Protection," gives facts regarding maintenance cost of windows and the other describes the use of solid bronze hardware on residence casements. Both pamphlets include illustrations and specifications.

Rock Drills—Ingersoll-Rand, 11 Broadway, New York, has published a complete catalog of rock drills and associated equipment including jackhamers, paving breakers, sharpeners, furnaces and blacksmith equipment, jackrod threading devices, calyx and diamond drills and accessories. Catalog No. 4201 contains many illustrations, tables and technical information.

Wire Ropes—American Cable division of American Chain & Cable Co., Wilkes-Barre, Pa., has issued a 32-page booklet illustrated with candid-camera type pictures showing how to save time when installing new lines, how the preforming process delivers a rope that is prebroken in, and imparting information on how to overcome rope-life destroying elements.

Duronze—Bridgeport Brass Co., Bridgeport, Conn., has published a manual containing 79 pages of valuable information concerning Duronze, trade name for high strength silicon bronzes. Besides interesting information upon types of work these alloys are used, the manual contains tables, graphs and illustrations with a section devoted to engineering data.

Power Costs—Troy Engine & Machine Co., Troy, Pa., has issued a 11-page bulletin, No. 101 which tells how 43 leading concerns and institutions in 29 different industries cut power costs for driving 19 different types of auxiliaries to an average of ½ cent per kilowatt hour. The bulletin contains three surveys in the steel, iron and tin plate manufacturing fields, including illustrations and engineering data.

Wire Ropes—Hazard Wire Rope division of American Chain & Cable Co., Wilkes-Barre, Pa., has published a 28-page pocket-size booklet entitled, "Wire Rope's Natural Enemies." The booklet contains a treatise on things that wear out rope and how to avoid or minimize their effect. Illustrations are included. A 4-page supplement is also available which is valuable to rope users in that it deals with the money value in keeping accurate records of wire rope service.

Waiting Attitude Rules Steel Market

Ship Tonnage Looms;

Scrap Has Setback;

New Export Records

MARKET IN TABLOID

DEMAND . . . *Buyers taking only pressing needs.*

PRICES . . . . *Scrap composite in small decline.*

PRODUCTION . . *Operating rate declines 2 points to 31 per cent.*

SHIPMENTS . . . *Light*

■ WITH all important consumers of steel remaining out of the market except for imperative needs the situation shows no improvement and little change from the conditions of several weeks.

The one bright spot, promising fairly large buying in the next few weeks, is found in shipbuilding. Placing of several tankers is likely to bring some immediate tonnages to mills, followed by heavier purchases as construction proceeds. Bids on the 12 cargo ships under the aegis of the maritime commission have been opened and distribution is likely to be made soon.

Automobile needs are light in view of shortened production of cars and the agricultural implement industry is in its seasonal quiet period, with smaller steel requirements. Miscellaneous consumers maintain their policy of making no future commitments until the wage and price situation clears.

Pig iron output in January totaled 1,439,191 tons, a loss of 4.3 per cent from the 1,503,474 tons made in December. The daily rate was 46,426 tons in January, compared with 48,499 tons in December. These figures are the lowest since December, 1934. This was the lowest January output since 1934 and compares with 3,219,741 tons produced in January, 1937. Active stacks at the end of the month numbered 91, the lowest since June, 1935, also at 91, and the lowest for January since 1935 when only 89 were in blast. In January, 1937, a total of 169 stacks were producing.

Steelmaking operations last week receded 2 points to 31 per cent, as the net result of adjustments at practically every center. Pittsburgh advanced 2 points and Chicago lost 2 points, with other changes from the preceding week for the most part equally small. Pittsburgh operated at 32 per cent, up 2 points; Birmingham, Ala., advanced 3 points to 63 per cent; Cincinnati gained 4 points to 44, Cleveland 2 points to 33 and St. Louis 8 points to 29. Chicago lost 2 points to 25 per cent, Eastern Pennsylvania 1 point to 30, Youngstown, O., 1 point to 26, Wheeling, W. Va., 2 points to 44, Detroit 5 points to 47 and Buffalo 4.5 points to 14 per cent. New England remained unchanged at 20 per cent.

Expectation of large buying by railroads in the event a rate advance is allowed is being discounted heavily. On present volume of traffic the financial situation of the carriers would not warrant heavy buying and the feeling is growing that higher charges in the absence of heavy movement will not yield as much business as had been expected. On the other hand some track and rolling stock requirements are so pressing that they are likely to be the source of some tonnage immediately on announcement of the decision on rates. Current buying by railroads indicates needs are pressing and can not be held back until after the rate request is answered.

Steel exports for 1937 attained sixth rank, exceeded only by the period 1916-1920, inclusive, and were 40 per cent greater than in 1929. Scrap exports totaled 4,095,894 tons, an alltime high. A feature of the scrap movement was that Europe took approximately the same tonnage as the Far East, the latter usually leading by a wide margin. This indicates extent of the hunger for raw materials in Europe. Exports of pig iron and tin plate were also the largest ever recorded. Imports for 1937 showed a slight decrease in volume from 1936 but an increase in value, due to larger tonnage of higher priced commodities.

Automobile assemblies last week were 51,443, off about 8000 from the week before. General Motors made 21,230, compared with 21,475; Ford assembled 20,700, against 22,765; Chrysler dropped to 2950 from 5950; independents slumped to 6563 from 8933.

After advancing for seven consecutive weeks and remaining unchanged for two weeks the composite price of steelmaking scrap last week dropped 7 cents to $13.83. The change was caused by a drop of 50 cents at Chicago, on the basis of dealer trading. The iron and steel composite lost 3 cents from the same cause and stands at $38.94. The finished steel composite is unchanged at $61.70.

COMPOSITE MARKET AVERAGES

	Feb. 5	Jan. 29	Jan. 22	One Month Ago Jan., 1938	Three Months Ago Nov., 1937	One ear Ago Feb., 1937	Five Years Ago Feb., 1933
Iron and Steel	$38.94	$38.97	$38.97	$38.95	$38.96	$36.74	$27.94
Finished Steel	61.70	61.70	61.70	61.70	61.70	55.92	45.35
Steelworks Scrap ..	13.83	13.90	13.90	13.85	13.32	19.19	6.33

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	Feb. 5, 1938	Jan. 1938	Nov. 1937	Feb. 1937
Steel bars, Pittsburgh	2.45c	2.45c	2.45c	2.20c
Steel bars, Chicago	2.50	2.50	2.50	2.25
Steel bars, Philadelphia	2.74	2.75	2.75	2.49
Iron bars, Terre Haute, Ind.	2.35	2.35	2.35	2.10
Shapes, Pittsburgh	2.25	2.25	2.25	2.05
Shapes, Philadelphia	2.45½	2.46½	2.46½	2.25½
Shapes, Chicago	2.30	2.30	2.30	2.10
Tank plates, Pittsburgh	2.25	2.25	2.25	2.05
Tank plates, Philadelphia	2.43½	2.44½	2.44½	2.23½
Tank plates, Chicago	2.30	2.30	2.30	2.10
Sheets, No. 10, hot rolled, Pitts.	2.40	2.40	2.40	2.15
Sheets, No. 24, hot ann., Pitts.	3.15	3.15	3.15	2.80
Sheets, No. 24, galv., Pitts.	3.80	3.80	3.80	3.40
Sheets, No. 10, hot rolled, Gary	2.50	2.50	2.50	2.25
Sheets, No. 24, hot anneal., Gary	3.25	3.25	3.25	2.90
Sheets, No. 24, galvan., Gary	3.90	3.90	3.90	3.50
Plain wire, Pittsburgh	2.90	2.90	2.90	2.60
Tin plate, per base box, Pitts.	$5.35	$5.35	$5.35	$4.85
Wire nails, Pittsburgh	2.75	2.75	2.75	2.25

Semifinished Material

Sheet bars, open-hearth, Youngs.	$37.00	$37.00	$37.00	$34.00
Sheet bars, open-hearth, Pitts.	37.00	37.00	37.00	34.00
Billets, open-hearth, Pittsburgh	37.00	37.00	37.00	34.00
Wire rods, No. 5 to $\frac{9}{32}$-inch, Pitts.	47.00	47.00	47.00	43.00

Pig Iron

	Feb. 5, 1938	Jan. 1938	Nov. 1937	Feb. 1937
Bessemer, del. Pittsburgh	$25.26	$25.26	$25.26	$22.30
Basic, Valley	23.50	23.50	23.50	20.50
Basic, eastern del. East. Pa.	25.26	25.34	25.34	22.51
No. 2 fdy., del. Pittsburgh	25.21	25.21	25.21	22.21
No. 2 fdry., Chicago	24.00	24.00	24.00	21.00
Southern No. 2, Birmingham	20.38	20.38	20.38	17.63
Southern No. 2, del. Cincinnati	23.89	23.89	23.89	20.94
No. 2X eastern, del. Phila.	26.135	26.21½	26.21½	23.38½
Malleable, Valley	24.00	24.00	24.00	21.00
Malleable, Chicago	24.00	24.00	24.00	21.00
Lake Sup., charcoal, del. Chicago	30.24	30.24	30.14	26.54
Gray forge, del. Pittsburgh	24.17	24.17	24.17	21.17
Ferromanganese, del. Pittsburgh	107.49	107.49	107.35	84.79

Scrap

Heavy melting steel, Pittsburgh	$14.25	$14.05	$14.10	$19.65
Heavy melt. steel, No. 2, E. Pa.	13.75	14.05	12.25	17.75
Heavy melting steel, Chicago	12.75	13.25	12.55	19.50
Rails for rolling, Chicago	15.25	14.90	15.10	20.75
Railroad steel specialties, Chicago	15.25	15.75	16.75	21.00

Coke

Connellsville, furnace, ovens	$4.25	$4.25	$4.37	$4.00
Connellsville, foundry, ovens	5.25	5.25	5.25	4.25
Chicago, by-product foundry, del.	11.00	11.00	11.00	11.00

STEEL, IRON, RAW MATERIAL, FUEL AND METALS PRICES

Except when otherwise designated, prices are base, f.o.b. cars.

Sheet Steel

Prices Subject to Quantity Extras and deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, del.	2.60c
New York, del.	2.74c
Philadelphia, del.	2.70c
Birmingham	2.55c
St. Louis, del.	2.63c
Granite City, Ill.	2.60c
Pac. base pts. f.o.b. cars	2.97½c

Hot Rolled Annealed No. 24

Pittsburgh	3.15c
Gary	3.25c
Chicago, delivered	3.28c
Detroit, delivered	3.35c
New York, delivered	3.49c
Philadelphia, del.	3.45c
Birmingham	3.30c
St. Louis, del.	3.38c
Granite City, Ill.	3.35c
Pac. base pts. f.o.b. cars	3.82½c

Galvanized No. 24

Pittsburgh	3.80c
Gary	3.90c
Chicago, delivered	3.93c
Philadelphia, del.	4.10c
New York, delivered	4.14c
Birmingham	3.95c
St. Louis, del.	4.03c
Granite City, Ill.	4.00c
Pac. base pts. f.o.b. cars	4.42½c

Tin Mill Black No. 28

Pittsburgh	3.30c
Gary	3.40c
St. Louis, delivered	3.53c
Granite City, Ill.	3.50c

Cold Rolled No. 10

Pittsburgh	3.10c
Gary	3.20c
Detroit, delivered	3.31c
Philadelphia, del.	3.40c
New York, del.	3.44c
St. Louis, del.	3.33c
Granite City, Ill.	3.30c
Pac. base pts. f.o.b. cars	3.72½c

Cold Rolled No. 20

Pittsburgh	3.55c
Gary	3.65c
Detroit, delivered	3.76c
Philadelphia, del	3.85c
New York, del.	3.89c
St. Louis	3.78c
Granite City, Ill.	3.75c

Enameling Sheets

Pittsburgh, No. 10	2.90c
Pittsburgh, No. 20	3.50c
Gary, No. 10	3.00c
Gary, No. 20	3.60c
St. Louis, No. 10	3.13c
St. Louis, No. 20	3.73c

Tin and Terne Plate

Gary base, 10 cents higher

Tin plate, coke (base box) Pittsburgh	$5.35
Waste-waste, 2.80c; strip	2.50c
Long ternes, No. 24, unassorted, Pitts.	4.10c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	24.00	25.00
Plates	27.00	29.00
Sheets	34.00	36.00
Hot strip	21.50	23.50
Cold strip	28.00	30.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	18.50	19.00	22.50	27.50
Plates	21.50	22.00	25.50	30.50
Sheets	26.50	29.00	32.50	36.50
Hot strip	17.00	17.50	23.00	28.00
Cold stp.	22.00	22.50	28.50	36.50

Steel Plate

Pittsburgh	2.25c
New York, del.	2.54c
Philadelphia, del.	2.44½c
Boston, delivered	2.66c
Buffalo, delivered	2.49½c
Chicago or Gary	2.30c
Cleveland, del.	2.45½c
Birmingham	2.40c
Coatesville, base	2.35c
Sparrows Pt., base	2.35c
Pacific basing points, fo.b. cars	2.82½c
St. Louis, delivered	2.52c

Structural Shapes

Pittsburgh	2.25c
Philadelphia, del.	2.46¼c
New York, del.	2.51¼c
Boston, delivered	2.64¼c
Bethlehem	2.35c
Chicago	2.30c
Cleveland, del.	2.46c
Buffalo	2.35c
Gulf Ports	2.66c
Birmingham	2.40c
Pacific coast basing pts., f.o.b. cars	2.82½c
St. Louis, del.	2.52c

Bars

Soft Steel

(Base, 3 to 25 tons)

Pittsburgh	2.45c
Chicago or Gary	2.50c
Duluth	2.60c
Birmingham	2.60c
Cleveland	2.50c
Buffalo	2.55c
Detroit, delivered	2.60c
Pacific coast basing pts., f.o.b. cars	3.02½c
Philadelphia, del.	2.75c
Boston, delivered	2.86c
New York, del.	2.79c

Rail Steel

To Manufacturing Trade

Pittsburgh	2.30c
Chicago or Gary	2.35c
Cleveland	2.35c
Moline, Ill.	2.35c
Buffalo	2.40c
Birmingham	2.45c

Iron

Terre Haute, Ind.	2.35c
Chicago	2.40c
Philadelphia	2.64c
Pittsburgh, refined	3.50-8.00c

Reinforcing

New billet, straight lengths, quoted by distributors

Pittsburgh	2.45c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.50c
Gulf ports	2.85c
Pacific coast ports, f.o.b. car docks	2.95c
Philadelphia, del.	2.75c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	2.30c
Chicago, Buffalo, Cleveland, Birm., Young.	2.35c
Gulf ports	2.80c

Wire Products

Prices apply to mixed carloads, base; less carloads subject to quantity extras.

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.75
Cement coated nails	$2.75

(Per pound)

Polished staples	3.45c
Galv. fence staples	3.70c
Barbed wire, galv.	3.40c
Annealed fence wire	3.15c
Galv. fence wire	3.55c
Woven wire fencing (base C. L. column)	.74
Single loop bale ties, (base C. L. column)	.63

To Manufacturing Trade

Plain wire, 6-9 ga.	2.90c
Galvanized wire	2.95c
Anderson, Ind. (merchant products only) and Chicago up $1; Duluth and Worcester up $2; Birmingham up $3.	
Spring wire, Pitts. or Cleveland	3.50c
Do., Chicago up $1, Worc. $2.	

Cold-Finished Carbon Bars, Shafting

Pittsburgh	2.90c
Chicago	2.95c
Gary, Ind.	2.95c
Detroit	2.95c
Cleveland	2.95c
Buffalo	3.00c

Subject to quantity deductions and extras. List dated Aug. 26, 1935; revised Oct. 1, 1936.

Alloy Steel Bars (Hot)

(Base, 3 to 25 tons)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 3.00c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.35	3100	0.70
2100	0.75	3200	1.35
2300	1.55	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo. 0.55
4600 0.20 to 0.30 Mo. 1.50-2.00 Ni. 1.10
5100 0.80-1.10 Cr. 0.45
5100 Cr. spring 0.15
6100 bars 1.20
6100 spring 0.85
Cr. N., Van. 1.50
Carbon Van. 0.85
9200 spring flats 0.15
9200 spring rounds, squares 0.40

Piling

Pittsburgh	2.60c
Chicago, Buffalo	2.70c

Strip and Hoops

(Base, hot-rolled, 25-1 ton)
(Base, cold-rolled, 25-3 tons)

Hot strip to 23½-in.	
Pittsburgh	2.40c
Chicago or Gary	2.50c
Birmingham base	2.55c
Detroit, del.	2.61c
Philadelphia, del.	2.70c
New York, del.	2.74c
Cooperage hoop,	
Pittsburgh	2.50c
Chicago	2.60c
Cold strip, 0.25 carbon and under, Pittsburgh, Cleveland	3.20c
Detroit, del.	3.41c
Worcester, Mass.	3.40c

Carbon	Cleve. Pitts.	Worcester, Mass.
0.26—0.50	3.20c	4.30c
0.51—0.75	4.45c	4.65c
0.76—1.00	6.30c	6.50c
Over 1.00	8.50c	8.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$42.50
Relay rails, Pittsburgh 20—100 lbs.	32.50-35.50
Light rails, billet qual., Pittsburgh, Chicago	$43.00
Do., rerolling quality	42.00
Angle bars, billet, Gary, Pittsburgh, So. Chicago	2.80c
Do., axle steel	2.35c
Spikes, R. R. base	3.15c
Track bolts, base	4.35c
Tie plate, base	$46.00

Base, light rails 25 to 60 lbs.; 20 lbs. up $2; 16 lbs. up $4; 12 lbs. up $8; 8 lbs. up $10. Base railroad spikes 200 kegs or more; base plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:

Carriage and Machine

½ x 6 and smaller	65-5 off
Do. larger, to 1-in.	60-10 off
Do. 1⅛ and 1¼-in.	60-5 off
Tire bolts	50 off

Plow Bolts

All sizes	65-5 off

Stove Bolts

In packages with nuts attached 70 off; in packages with nuts separate 70-10 off; in bulk 80 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	50-10-5 off
Elevator bolts	50-10-5 off

Nuts

S. A. E. semifinished hex.: ½ to ⅞-inch	60-10 off
Do., 9/16 to 1-inch	60-5 off
Do., over 1-inch	60 off

Hexagon Cap Screws

Milled	50-10 off
Upset, 1-in., smaller	60 off

Square Head Set Screws

Upset, 1-in., smaller	75 off
Headless set screws	75 off

Rivets, Wrought Washers

Structural, Pittsburgh, Cleveland	3.60c
Structural, Chicago	3.70c
⅞-inch and smaller, Pitts., Chi., Cleve.	65-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs. l.c.l. $5.40; c.l. $5.75	off

Cut Nails

Cut nails, C. L. Pitts. (10% disc. on all extras)	$3.60
Do., less carloads, 5 kegs or more, no discount on any extras	$3.90
Do., under 5 kegs no disc. on any extras	$4.05

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts, Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
½	59½	49
¾	62½	53
1—3	64½	55½

Iron

¾	26	8
1—1¼	30	14
1½	34	16½
2	33½	16

Lap Weld

Steel

2	57	47½
2½—3	60	50½
3½—6	62	52½
7 and 8	61	50½
9 and 10	60½	50

Iron

2	26½	10
2½—3½	27½	12½
4	29½	16
4½—8	28½	15
9—12	24½	10

Line Pipe

Steel

1 to 3, butt weld	63½
2, lap weld	56
2½ to 3, lap weld	59
3½ to 6, lap weld	61
7 and 8, lap weld	60
10-inch, lap weld	59½
12-inch, lap weld	58½

Butt Weld

Iron

	Blk.	Galv.
¾	25	7
1 and 1¼	29	13
1½	33	15½
2	32½	15

Lap Weld

1½	23½	7
2	25½	9
2½ to 3½	26½	11½
4	28½	15
4½ to 8	27½	14
9 to 12	23½	9

Boiler Tubes

Carloads minimum wall seamless steel boiler tubes, cut lengths 4 to 24 feet, f.o.b. Pittsburgh, base price per 100 feet subject to usual extras.

Lap Weld

Sizes	Steel	Charcoal Iron
1½" OD x 13 Ga.	$10.45	$23.71
1¾" OD x 13 Ga.	11.89	22.93
2" OD x 13 Ga.	13.31	19.35
2" OD x 11 Ga.	15.49	23.36
2¼" OD x 13 Ga.	14.82	21.68
2¼" OD x 11 Ga.	17.38	26.02
2½" OD x 12 Ga.	17.82	26.57
2¾" OD x 12 Ga.	18.86	29.00
3" OD x 12 Ga.	19.73	31.36
3½" OD x 11 Ga.	24.89	39.81
4" OD x 10 Ga.	30.81	49.90
5" OD x 9 Ga.	47.57	73.93
6" OD x 7 Ga.	73.25	....

Seamless

	Hot Rolled	Cold Drawn
1" OD x 13 Ga.	$ 8.41	$ 9.46
1¼" OD x 13 Ga.	9.96	11.21
1½" OD x 13 Ga.	11.00	12.38
1¾" OD x 13 Ga.	12.51	14.09
2"OD x 13 Ga.	14.02	15.78
2¼" OD x 13 Ga.	15.63	17.60
2¼" OD x 12 Ga.	17.21	19.37
2½" OD x 12 Ga.	18.85	21.22
2¾" OD x 12 Ga.	19.98	22.49
3" OD x 12 Ga.	20.97	23.60
4½" OD x 10 Ga.	40.15	45.19
3½" OD x 11 Ga.	26.47	29.79
4" OD x 10 Ga.	32.83	36.94
5" OD x 9 Ga.	50.38	56.71
6" OD x 7 Ga.	77.35	87.07

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$46.00-47.00
4-in., Birmingham	49.00-50.00
4-in., Chicago	57.20-58.20
6 to 24-in., Chicago	54.20-55.20
6-in. & over, east fdy.	50.00
Do., 4-in.	53.00

Class A Pipe $3 over Class B. Stnd. fitgs., Birm., base $100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., Buffalo, Young., Birm.	$37.00
Philadelphia	42.30
Duluth	39.00

Forging Billets

6 x 6 to 9 x 9-in., base

Pitts., Chicago, Buffalo	43.00
Forging, Duluth	45.00

Sheet Bars

Pitts., Cleve., Young Sparrows Point	37.00

Slabs

Pitts., Chicago, Cleveland, Youngstown	37.00

Wire Rods

Pitts., Cleve., No. 5 to ⅝-inch incl.	47.00
Do., over ⅝ to ¾-inch incl.	52.00

Chicago up $1; Worcester up $2.

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Pt.	2.10c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$4.00- 4.50
Connellsville, fdry.	5.00- 5.50
Connell. prem. fdry	5.75- 6.25
New River fdry.	6.50- 6.75
Wise county fdry.	5.75- 6.00
Wise county fur.	4.75- 5.00

By-Product Foundry

Newark, N. J., del.	10.88-11.35
Chi., ov., outside del.	10.25
Chicago, del.	11.00
Milwaukee, ovens	11.00
New England, del.	12.50
St. Louis, del.	11.00-11.50
Birmingham, ovens	7.50
Indianapolis, del.	10.50
Cincinnati, del.	10.50
Cleveland, del.	11.05
Buffalo, del.	10.50
Detroit, del.	11.10
Philadelphia, del.	10.63

Coke By-Products

Spot, gal. Producers' Plants

Pure and 90% benzol	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c

Per lb. f.o.b. Frankford and St. Louis

Phenol (200 lb. drums)	16.25c
do. (450 lbs.)	15.25c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls. to jobbers	7.25c
Per ton, bulk, f.o.b. oven or port	
Sulphate of ammonia	$29.50

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25 sil.; 50c diff. below 1.75 sil. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$25.00	$25.50	$23.50	$26.00
Birdsboro, Pa.	25.00	25.50	24.50	26.00
Birmingham, Ala.‡	20.38	.....	19.38	25.00
Buffalo	24.00	24.50	23.00	25.00
Chicago	24.00	24.00	23.50	24.50
Cleveland	24.00	24.00	23.50	24.50
Detroit	24.00	24.00	23.50	24.50
Duluth	24.50	24.50	.....	25.00
Erie, Pa.	24.00	24.50	23.50	25.00
Everett, Mass.	25.75	26.25	25.25	26.75
Granite City, Ill.	24.00	24.00	23.50	24.50
Hamilton, O.	24.00	24.00	23.50	.....
Neville Island, Pa.	24.00	24.00	23.50	24.50
Provo, Utah	22.00	.....	.....	.....
Sharpsville, Pa.	24.00	24.00	23.50	24.50
Sparrow's Point, Md.	25.00	.....	24.50	.....
Swedeland, Pa.	25.00	25.50	24.50	26.00
Toledo, O.	24.00	24.00	23.50	24.50
Youngstown, O.	24.00	24.00	23.50	24.50

‡Subject to 38 cents deduction for 0.70 per cent phosphorus or higher.

Delivered from Basing Points:				
Akron, O., from Cleveland	25.39	25.39	24.89	25.89
Baltimore from Birmingham	25.78	.....	24.66	.....
Boston from Birmingham	26.57	.....	26.07	.....
Boston from Everett, Mass.	26.30	26.80	25.80	27.30
Boston from Buffalo	26.45	26.95	25.95	27.45
Brooklyn, N. Y., from Bethelehem	27.47	27.97	.....	.....
Brooklyn, N. Y., from Bmghm.	27.25	.....	.....	.....
Canton, O., from Cleveland	25.39	25.39	24.89	25.89
Chicago from Birmingham	24.42	.....	23.30	.....
Cincinnati from Hamilton, O.	24.27	25.11	24.61	.....
Cincinnati from Birmingham	23.89	.....	22.89	.....
Cleveland from Birmingham	24.32	.....	23.82	.....
Mansfield, O., from Toledo, O.	25.94	25.94	25.44	25.44
Milwaukee from Chicago	25.10	25.10	24.60	25.10
Muskegon, Mich., from Chicago, Toledo or Detroit	27.10	27.10	26.60	27.60
Newark, N. J., from Birmingham	26.21	.....	.....	.....
Newark, N. J., from Bethlehem	26.53	27.03	.....	.....
Philadelphia from Birmingham	25.58	.....	25.46	.....
Philadelphia from Swedeland, Pa.	25.84	26.34	25.34	.....
Pittsburgh district from Neville Island	Neville, base plus 63c, 76c, and $1.13 switch'g charges			
Saginaw, Mich., from Detroit	26.45	26.45	25.95	25.95
St. Louis, northern	24.55	24.55	24.05	.....
St. Louis from Birmingham	†24.12	.....	23.82	.....
St. Paul from Duluth	26.08	26.08	.....	26.58

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $28.50, Phil. base, standard and copper bearing, $29.63.

Gray Forge		**Charcoal**	
Valley furnace	$23.50	Lake Superior fur.	$27.00
Pitts. dist. fur.	23.50	do., del. Chicago	30.24
		Lyles, Tenn.	26.50

Silvery†

Jackson county, O., base: 6-6.50 per cent $28.50; 6.51-7—$29.00; 7-7.50—$29.50; 7.51-8—$30.00; 8-8.50—$30.50; 8.51-9—$31.00; 9-9.50—$31.50; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works, Net Prices

Fire Clay Brick

Super Quality

Pa., Mo., Ky. $64.60

First Quality

Pa., Ill., Md., Mo., Ky. 51.30
Alabama, Georgia 51.30
New Jersey 56.00

Second Quality

Pa., Ill., Ky., Md., Mo. 46.55
Georgia, Alabama 41.80
New Jersey 51.00

Ohio

First quality 43.70
Intermediate 39.90
Second quality 35.15

Malleable Bung Brick

All bases $59.85

Silica Brick

Pennsylvania $51.30
Joliet, E. Chicago 59.85
Birmingham, Ala. 51.30

Ladle Brick

(Pa., O., W. Va., Mo.)

Dry press $30.00
Wire cut $28.00

Magnesite

Imported dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) $45.00
Domestic dead - burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) 43.00

Base Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick $49.00
Chem. bonded chrome 49.00
Magnesite brick 69.00
Chem. bonded magnesite 59.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton $23.50-24.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail $20.00
Do., for barge $22.00
No. 2 lump 22.00-23.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82%, tidewater, duty pd. $102.50
Do., Baltimore, base 102.50
Do., del. Pittsburgh 107.49
Spiegeleisen, 19-21% dom. Palmerton, Pa., spot 33.00
Do., New Orleans 33.00
Do., 26-28%, Palmerton 39.00
Ferrosilicon, 50% freight allowed, c.l. 69.50
Do., ton lot 80.50
Do., 75 per cent 126.00
Spot, $5 a ton higher.
Silicoman., 2½ carbon 106.50
2% carbon 111.50; 1%, 121.50
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del. 10.50
Ferrotungsten, stand., lb. con. del. cars 2.00-2.25
Ferrovanadium, 35 to 40% lb., cont. 2.70-2.90
Ferrotitanium, c. l., prod-plant, frt. all., net ton 142.50
Contract, ton lots 145.00
Spot, ton lots 150.00
Ferrophosphorus, per ton, c.l., 17-18% Rockdale, Tenn., basis, 18%, $3 unitage 58.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Monsanto, Tenn., 24% $3 unitage 75.00
Ferromolybdenum, stand. 55-65%, lb. f.o.b. mill 0.95
Molybdate, lb. cont. f.o.b. mill 0.80
Technical molybdenum trioxide, 53 to 60% molybdenum, f.o.b. mill 0.80
†Carloads. Quan. diff. apply.

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin, New York Spot	Straits Tin, New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony American Spot, N. Y.	Nickel Cathodes
Jan. 29	10.00	10.12½	9.52½	40.00	40.25	4.90	4.75	5.00	20.00	13.75	35.00
Jan. 31	10.00	10.12½	9.52½	40.50	40.75	4.90	4.75	5.00	20.00	13.75	35.00
Feb. 1	10.00	10.12½	9.52½	40.87½	41.12½	4.90	4.75	5.00	20.00	13.75	35.00
Feb. 2	10.00	10.12½	9.52½	41.00	41.25	4.90	4.75	5.00	20.00	13.75	35.00
Feb. 3	10.00	10.12½	9.52½	40.50	40.87½	4.90	4.75	5.00	20.00	13.75	35.00
Feb. 4	10.00	10.12½	9.52½	40.50	40.87½	4.90	4.75	5.00	20.00	13.75	35.00

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 10.00c *Conn. copper*

Sheets

*Yellow brass (high) 16.62½
*Copper, hot rolled 18.12½
Lead, cut to jobbers 8.25
Zinc, 100-lb. base 10.00

Tubes

*High, yellow brass 19.37½
*Seamless copper 18.62½

Rods

*High yellow brass 12.62½
*Copper, hot rolled 14.62½

Anodes

*Copper, untrimmed 15.37½

Wire

*Yellow brass (high) 16.62½

OLD METALS

Nom. Del. buying prices

No. 1 Composition Red Brass

*New York 6.10-6.12½
*Cleveland 6.50-6.75
*Chicago 6.00-6.25
St. Louis 5.50-5.75

Heavy Copper and Wire

*New York, No. 1 7.25-7.37½
*Cleveland, No. 1 7.25-7.50
*Chicago, No. 1 7.50-7.75
St. Louis 7.25-7.50

Composition Brass Borings

*New York 5.25-5.37½

Light Copper

*New York 5.25-5.37½
*Cleveland 5.50-5.75
*Chicago 5.75-6.00
St. Louis 5.00-5.25

Light Brass

*Cleveland 3.25-3.50
Chicago 4.00-4.12½
St. Louis 3.25-3.75

Lead

*New York 3.87½-4.00
*Cleveland 3.25-3.50
Chicago 3.75-3.87½
St. Louis 3.25-3.50

Zinc

New York 2.12½-2.25
*Cleveland 2.00-2.25
St. Louis 2.25-2.50

Aluminum

Borings, Cleveland 6.75-7.00
Mixed cast, Cleve. 9.75-10.00
*Clips, soft, Cleve. 12.50-12.75
Mixed cast, St. L. 9.50-10.00

SECONDARY METALS

Brass, ingot, 85-5-5-5, lcl 10.75
Stand. No. 12 alum. 17.00-17.50

WAREHOUSE STEEL PRICES

Base Prices in Cents Per Pound, Delivered Locally, Subject to Prevailing Differentials

	Soft Bars	Bands	Hoops	Plates ¼-In. & Over	Structural Shapes	Floor Plates	Sheets: Hot Rolled No. 10	Sheets: Hot Roll Ann. No. 24	Sheets: Galv. No. 24
Boston	4.20c	4.40c	5.40c	4.08c	4.07c	5.73c	4.15c	4.90c	5.10c
New York (Metropolitan)	4.12	4.32	4.32	4.00	3.97	5.60	4.07	4.50	5.00
Philadelphia	4.00	4.10	4.35	3.90	3.90	5.25	4.00	4.65	5.30
Baltimore	4.00	4.20	4.45	3.90	3.90	5.50	3.95	4.50	4.70
Norfolk, Va.	4.15	4.35	4.35	4.05	4.05	5.65	4.10	4.70	5.35
Buffalo	3.90	4.22	4.22	3.92	3.80	5.52	3.97	4.80	5.35
Pittsburgh	3.80	4.00	4.00	3.70	3.70	5.30	3.75	4.50	5.15
Cleveland	3.75	4.16	4.16	3.86	3.86	5.46	3.91	4.66	5.31
Detroit	3.935	4.185	4.185	3.95	3.95	5.55	3.935	4.685	5.40
Cincinnati	4.05	4.25	4.25	3.95	3.95	5.55	4.00	4.75	5.40
Chicago	3.85	4.10	4.10	3.75	3.75	5.35	3.85	4.60	5.25
Minneapolis	4.10	4.35	4.35	4.00	4.00	5.60	4.10	4.75	5.25
Milwaukee	3.96	4.21	4.21	3.86	3.86	5.46	3.96	4.71	5.36
St. Louis	4.09	4.34	4.34	3.99	3.99	5.59	4.09	4.84	5.49
Kansas City	4.34	4.59	4.59	4.24	4.24	5.84	4.10	4.85	5.50
Memphis	4.31	4.51	4.51	4.21	4.21	5.85	4.26	5.01	5.66
Chattanooga	4.21	4.41	4.41	4.11	4.11	5.91	4.16	4.06	4.66
Tulsa, Okla.	4.79	5.04	5.04	4.69	4.69	6.29	4.79	5.54	6.19
Birmingham, Ala.	3.85	4.05	4.05	3.75	3.75	5.96	3.80	4.55	5.20
New Orleans	4.10	4.65	4.65	4.00	4.00	5.95	4.25	4.75	5.15
Houston, Tex.	3.75	6.00	6.40	3.95	3.95	6.00	4.50	5.25	5.65
Seattle	4.45	4.95	6.30	4.25	4.25	6.00	4.50	5.35	5.90
Portland, Oreg.	4.00	4.50	6.50	4.00	4.25	5.70	4.20	5.15	5.90
Los Angeles	4.30	4.80	6.55	4.30	4.30	4.30	4.50	5.00	5.25
San Francisco	4.20	4.80	6.50	4.05	4.05	5.55	4.30	5.15	5.85

	Cold Rolled Strip	Cold Finished Bars	SAE Hot-rolled Bars (Unannealed): 1035-1050	2300 Series	3100 Series	4100 Series	6100 Series	SAE Cold Drawn Bars: 2300	3100
Boston	3.845c	4.65c	4.50c	7.97c	6.52c	6.27c	8.37c	8.97c	7.52c
New York	3.92	4.57	4.32	7.82	6.37	6.12	....	9.00	7.55
Philadelphia	3.88	4.53	4.25	....	....	....	....	....	....
Baltimore	....	4.50	4.15	....	....	....	....	....	....
Norfolk, Va.	....	4.60	....	....	....	....	....	....	....
Buffalo	3.79	4.35	4.10	7.60	6.15	5.90	8.00	8.60	8.15
Pittsburgh	....	4.15	3.95	7.70	6.25	8.50	9.10	8.70	7.25
Cleveland	3.60	4.30	3.95	7.78	6.33	6.33	8.18	8.60	7.15
Detroit	3.78	4.30	4.085	7.89	6.44	6.19	7.74	8.88	7.43
Cincinnati	....	4.50	4.07	7.91	6.46	6.21	9.31	8.92	7.47
Chicago	3.87	4.30	4.05	7.60	6.15	5.90	9.00	8.60	7.15
Minneapolis	....	4.77	4.25	7.95	6.50	8.97	9.57	9.17	7.72
Milwaukee	....	4.41	4.16	7.81	6.36	8.61	9.21	8.81	7.36
St. Louis	3.96	4.54	4.29	7.94	6.49	6.24	8.34	8.94	7.49
Kansas City	4.37	4.79	....	....	....	....	....	....	....
Memphis	....	4.80	....	....	....	....	....	....	....
Chattanooga	....	4.86	....	....	....	....	....	....	....
Tulsa, Okla.	....	5.24	....	....	....	....	....	....	....
New Orleans	5.00	5.10	....	....	....	....	....	....	....
Houston	....	....	....	....	....	....	....	....	....
Seattle	....	5.85	6.05	....	8.00	8.00	8.65	....	....
Portland, Oreg.	....	5.85	5.85	9.00	8.00	7.85	8.70	....	....
Los Angeles	5.96	6.85	4.65	9.40	8.55	8.40	9.05	10.40	9.55
San Francisco	9.30	6.80	5.20	9.65	8.80	8.65	9.30	10.65	9.80

CURRENT IRON AND STEEL PRICES OF EUROPE

Dollars at Rates of Exchange, Feb. 3

Export Prices f. o. b. Port of Dispatch—

By Cable or Radio

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons: Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Si.	$30.00 6 0 0	$19.50	2 9 0
Basic bessemer	....	....	....
Hematite, Phos. .03-.05	36.25 7 5 0*	19.50	2 9 0
Billets	$39.38 7 17 6	$43.01	5 7 6
Wire rods, No. 5 gage	56.38 11 5 6	42.00 to 44	5 5 0 to 5 10 0
Standard rails	$50.63 10 2 6	$46.00	5 15 0
Merchant bars	2.62c 11 15 0	1.91c	5 5 0
Structural shapes	2.37c 10 12 6	1.76c	4 17 6
Plates, †¼ in. or 5 mm.	2.58c 11 11 3	2.22c	6 2 6
Sheets, black, 24 gage or 0.5 mm.	3.12c 14 0 0	2.81c	7 15 0*
Sheets, gal., 24 ga., corr.	3.74c 16 15 0	3.44c	9 10 0
Bands and strips	2.95c 13 5 0	1.91c to 1.99c	5 5 0 to 5 10 0
Plain wire, base	4.35c 19 10 0	2.22c to 2.63c	6 2 6 to 7 5 0
Galvanized wire, base	5.18c 23 5 0	2.84c to 2.94c	7 17 6 to 8 2 6
Wire nails, base	4.13c 18 10 0	2.53c to 2.71c	7 0 0 to 7 10 0
Tin plate, box 108 lbs.	$5.63 1 2 6	....	....

British ferromanganese $102.50 delivered Atlantic seaboard, duty-paid.

Domestic Prices at Works or Furnace—

Last Reported

	£ s d	French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5.	$27.25 5 9 0(a)	$18.48	563½	$24.58	725	$25.44	63
Basic bess. pig iron	25.00 5 0 0(a)	.....	...	.....	...	28.06	(b)69.50
Furnace coke	8.75 1 15 0	6.20	189	7.29	215	7.67	19
Billets	39.38 7 17 6	27.55	840	32.54	960	38.97	96.50
Standard rails	2.26c 10 2 6	1.73c	1,150	2.06c	1,375	2.38c	132
Merchant bars	2.55c 11 9 0	1.62c	1,080	1.65c	1,100	1.98c	110
Structural shapes	2.46c 11 0 6	1.58c	1,055	1.65c	1,100	1.93c	107
Plates, †¼-in. or 5 mm.	2.61c 11 14 3	2.03c	1,350	2.06c	1,375	2.29c	127
Sheets, black	3.51c 15 15 0§	2.35c	1,565‡	2.36c	1,575‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	4.13c 18 10 0	3.38c	2,250	4.50c	3,000	6.66c	370
Plain wire	4.35c 19 10 0	2.49c	1,660	2.48c	1,650	3.11c	173
Bands and strips	2.72c 12 4 0	1.82c	1,210	2.32c	1,550	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. (a) del. Middlesbrough. (b) hematite. °Close annealed.

**Gold pound sterling carries a premium of 64.4 per cent over paper sterling.

IRON AND STEEL SCRAP PRICES

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham, No. 1	10.00
Birmingham, No. 2	9.00
Bos. dock No. 1 exp.	14.00-14.50
N. Eng. del. No. 1	13.50
Buffalo, No. 1	12.50-13.00
Buffalo, No. 2	10.50-11.00
Chicago, No. 1	12.50-13.00
Cleveland, No. 1	12.50-13.00
Cleveland, No. 2	11.50-12.00
Detroit, No. 1	9.50-10.00
Eastern Pa., No. 1	15.00
Eastern Pa., No. 2	13.50-14.00
Federal, Ill.	11.25-11.75
Granite City, R. R.	12.75-13.25
Granite City, No. 2	11.25-11.75
Los Angeles, No. 1	15.00-17.50
Los Angeles, No. 2	13.50-16.00
New York, No. 1	†11.00
N. Y. dock No. 1 exp.	13.50
Pitts., No. 1 (R. R.)	15.50-16.00
Pitts., No. 1 (dlr.)	14.00-14.50
Pittsburgh, No. 2	13.00-13.50
St. Louis, R. R.	12.75-13.25
St. Louis, No. 2	11.25-11.75
San Francisco, No. 1	14.00-15.00
Seattle, No. 1	8.00
Toronto, dirs. No. 1	10.00
Valleys, No. 1	13.50-14.00

COMPRESSED SHEETS

Buffalo, dealers	10.50-12.00
Chicago, factory	11.50-12.00
Chicago, dealer	10.50-11.00
Cleveland	12.00-12.50
Detroit	10.25-10.75
E. Pa., new mat.	15.00
E. Pa., old mat.	10.50-11.00
Los Angeles	13.00-16.00
Pittsburgh	14.00-14.50
St. Louis	8.50- 9.00
Valleys	12.50-13.00

BUNDLED SHEETS

Buffalo	11.50
Cincinnati, del.	9.50-10.00
Cleveland	9.00- 9.50
Los Angeles	11.50-14.50
Pittsburgh	13.00-13.50
St. Louis	6.75- 7.00
Toronto, dealers	7.00

SHEET CLIPPINGS, LOOSE

Chicago	7.00- 7.50
Cincinnati	6.00- 6.50
Detroit	7.00- 7.50
† Los Angeles	4.00
St. Louis	5.50- 6.00

STEEL RAILS, SHORT

Birmingham	15.00
Buffalo	17.50-18.00
Chicago (3 ft.)	15.50-16.00
Chicago (2 ft.)	16.00-16.50
Cincinnati, del.	17.00-17.50
Detroit	14.50-15.00
Los Angeles	18.00-22.00
Pitts, 3 ft. and less	18.25-18.75
St. Louis, 2 ft. & less	15.00-15.50

STEEL RAILS, SCRAP

Boston district	†11.00
Buffalo	15.50-16.00
Chicago	12.50-13.00
Cleveland	16.50-17.00
Pittsburgh	15.75-16.25
St. Louis	13.50-14.00
Seattle	10.00

STOVE PLATE

Birmingham	8.00- 8.50
Boston, district	†8.25- 8.50
Buffalo	10.50
Chicago, net	8.50- 9.00
Cincinnati, dealers	5.50- 6.00
Detroit, net	8.50- 9.00
Eastern Pa.	13.00-13.50
New York, fdry.	†9.50-10.00
St. Louis	9.00- 9.50
Toronto, deal'rs, net	9.00

SPRINGS

Buffalo	17.50-18.00
Chicago, coil	16.50-17.00
Chicago, leaf	15.50-16.00
Eastern Pa.	18.00-18.50
Pittsburgh	18.25-18.75
St. Louis	15.25-15.75

ANGLE BARS—STEEL

Chicago	14.50-15.00
St. Louis	12.50-13.00

RAILROAD SPECIALTIES

Chicago	15.00-15.50

LOW PHOSPHORUS

Buffalo, crops	17.00-17.50
Cleveland, crops	19.50-20.50
Eastern Pa., crops	19.00-19.50
Pittsburgh, crops	18.00-18.50

FROGS, SWITCHES

Chicago	12.50-13.00
St. Louis, cut	13.50-14.00

SHOVELING STEEL

Federal, Ill.	11.25-11.75
Granite City, Ill.	11.25-11.75
Los Angeles (net)	16.00-18.00
Toronto, dealers	8.00

RAILROAD WROUGHT

Birmingham	11.00-11.50
Boston district	†9.00- 9.50
Chicago, No. 1 net	10.00-10.50
Cincinnati, No. 2	9.50-10.00
Eastern Pa., No. 1	15.50-16.00
St. Louis, No. 1	9.00- 9.50
St. Louis, No. 2	12.75-13.25
Toronto, No. 1 dlr.	16.00

SPECIFICATION PIPE

Eastern Pa.	14.00-14.50
New York	†9.00- 9.50

BUSHELING

Buffalo, No. 1	10.50-11.00
Chicago, No. 1	11.50-12.00
Cincin., No. 1, deal.	8.50- 9.00
Cincinnati, No. 2	3.00- 3.50
Cleveland, No. 2	8.50- 9.00
Detroit, No. 1, new	9.50-10.00
Valleys, new, No. 1	12.50-13.00
Toronto, dealers	7.00

MACHINE TURNINGS

Birmingham	6.00- 7.00
Buffalo	6.25- 6.75
Chicago	6.50- 7.00
Cincinnati, dealers	4.00- 4.50
Cleveland	7.50- 8.00
Detroit	5.25- 5.75
Eastern Pa.	8.00- 8.50
Los Angeles	4.00- 8.00
New York	†5.00- 5.50
Pittsburgh	8.00- 8.50
St. Louis	5.00- 5.50
Toronto, dealers	7.00
Valleys	9.50-10.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†2.50
Buffalo	6.50- 7.00
Cincinnati, dealers	3.50- 4.00
Cleveland	9.00- 9.50
Detroit	6.25- 6.75
Eastern Pa.	7.50- 8.00
New York	†4.50- 5.00
Pittsburgh	7.00- 7.50
Toronto, dealers	7.50

CAST IRON BORINGS

Birmingham	6.00- 7.00
Boston dist. chem.	†7.50- 8.00
Bos. dist. for mills	†7.00- 7.50
Buffalo	6.50- 7.00
Chicago	6.50- 7.00
Cincinnati, dealers	3.50- 4.00
Cleveland	9.00- 9.50
Detroit	6.25- 6.75
E. Pa., chemical	13.50-14.00
New York	†4.50- 5.00
St. Louis	5.00- 5.50
Toronto, dealers	7.50

PIPE AND FLUES

Cincinnati, dealers	7.00- 7.50
Chicago, net	7.50- 8.00

RAILROAD GRATE BARS

Buffalo	9.00- 9.50
Chicago, net	8.50- 9.00
Cincinnati	5.50- 6.00
Eastern Pa.	13.00-13.50
New York	†9.50-10.00
St. Louis	9.00- 9.50

FORGE FLASHINGS

Boston district	†7.00
Buffalo	10.50-11.00
Cleveland	11.00- 11.50
Detroit	9.00- 9.50
Los Angeles	9.00
Pittsburgh	12.75-13.25

FORGE SCRAP

Boston district	†6.50
Chicago, heavy	15.50-16.00

ARCH BARS, TRANSOMS

St. Louis	15.50-16.00

AXLE TURNINGS

Boston district	†7.50
Buffalo	12.00-12.50
Chicago, elec. fur.	11.50-12.00
Eastern Pa.	14.00-14.50
St. Louis	9.50-10.00
Toronto	8.00

STEEL CAR AXLES

Birmingham	16.00-17.00
Buffalo	17.00-17.50
Boston district	†14.00
Chicago, net	18.00-18.50
Eastern Pa.	21.50-22.00
St. Louis	18.50-19.00

SHAFTING

Boston district	†15.00
New York	†15.50-16.00
Eastern Pa.	19.00-19.50
St. Louis	13.00-13.50

CAR WHEELS

Birmingham	14.00-15.00
Boston dist., iron	†10.00
Buffalo, steel	17.00-17.50
Chicago, iron	15.00-15.50
Chicago rolled steel	15.00-15.50
Cincinnati, iron	15.00-15.50
Eastern Pa., iron	15.50-16.00
Eastern Pa., steel	18.00-18.50
Pittsburgh, iron	15.00-15.50
Pittsburgh, steel	18.25-18.75
St. Louis, iron	14.00-14.50
St. Louis, steel	15.50-16.00

NO. 1 CAST SCRAP

Birmingham	14.00-14.50
Boston, No. 1 mach.	†11.00
N. Eng. del. No. 2	12.00
N. Eng. del. textile	15.50-16.00
Buffalo, cupola	13.50-14.00
Buffalo, mach.	15.00-15.50
Chicago, agri. net	10.50-11.00
Chicago, auto	11.50-12.00
Chicago, railr'd net	10.50-11.00
Chicago, mach. net	12.50-13.00
Cincin., mach. cup.	10.50-11.00
Cleveland, mach.	17.00-17.50
Eastern Pa., cupola	16.00-16.50
E. Pa., mixed yard	14.00-14.50
Los Angeles	13.00-14.00
Pittsburgh cupola	16.00-16.50
San Francisco, del.	13.50-14.00
Seattle	8.00
St. Louis, No. 1	12.00-12.50
St. L., No. 1, mach.	12.50-13.00
Toronto, No. 1, mach., net	12.50

HEAVY CAST

Boston dist. break.	†9.75
N. Eng., del.	12.50-13.00
Buffalo, break	11.00-11.50
Cleveland, break.	14.50-15.50
Detroit, break.	10.00-10.50
Detroit, auto net	12.50-13.00
Eastern Pa.	14.50
Los Angeles	13.00-14.00
New York, break.	†10.50-11.00
Pittsburgh	12.50-13.00

MALLEABLE

Birmingham, R. R.	12.50-13.50
New England, del.	16.00
Buffalo	13.50-14.00
Chicago, R. R.	14.00-14.50
Cincin., agri. del.	10.50-11.00
Cleveland, rail	15.50-16.00
Detroit, auto	11.50-12.00
Eastern Pa., R. R.	16.50-17.50
Los Angeles	13.00-14.00
Pittsburgh, rail	13.75-14.25
St. Louis, R. R.	14.00-14.50

RAILS FOR ROLLING

5 feet and over

Birmingham	16.00-17.00
Boston	†12.00
Chicago	15.00-15.50
Eastern Pa.	18.00-18.50
New York	†15.00-15.50
St. Louis	14.50-15.00

LOCOMOTIVE TIRES

Chicago (cut)	15.50-16.00
St. Louis, No. 1	14.75-15.25

LOW PHOS. PUNCHINGS

Buffalo	17.00-17.50
Chicago	14.50-15.00
Eastern Pa.	19.00-20.00
Pittsburgh (heavy)	18.00-18.50
Pittsburgh (light)	17.50-18.00
Seattle	15.00

Iron Ore

Lake Superior Ore

Gross ton, 51½ % Lower Lake Ports

Old range bessemer	$5.25
Mesabi nonbess.	4.95
High phosphorus	4.85
Mesabi bessemer	5.10
Old range nonbess.	5.10

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.63% con.	9.00-10.00
Cop.-free low phos. 58-60%	nominal

Foreign Ore

Cents per unit, f.a.s. Atlantic

Foreign manganiferous ore, 45.55% iron, 6-10% man. nom.	12.00-13.00
No. Afr. low phos.	nominal
Swedish low phos.	17.00-18.00
Spanish No. Africa basic, 50 to 60% nom.	12.00
Tungsten, sh. ton. unit, duty paid nom.	24.50-25.50
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$25.50-26.50
Molybdenum ores sulphide, per lb. molybdenum contained, f.o.b. mill	0.75

Manganese Ore

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52% nom.	45.00
So. African, 50-52% nom.	45.00
Indian, 50-52%	Nominal

—The Market Week—

Sheets

Sheet Prices, Page 84

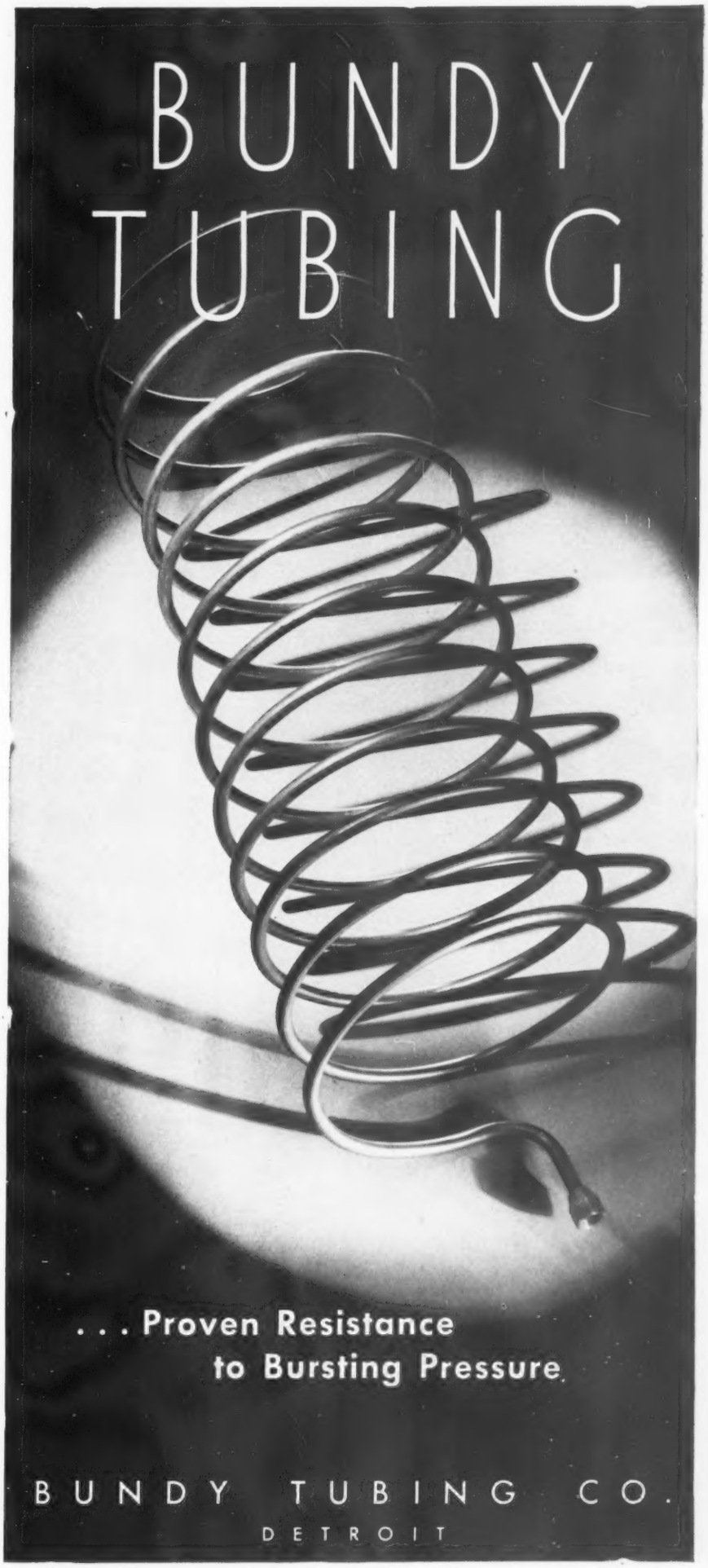
Pittsburgh—Production on sheets for spring and summer trade is going ahead slowly, with rates holding steady. Operations on common sheets are at 30 per cent of capacity, with jobbing mills reporting 24 per cent. Lack of automotive demand continues to hold down strip production, with hot strip slightly more active than cold, reported at 22 per cent, as against 18 per cent for cold. The demand is most noticeable in galvanized, where the rate is holding strong at 35 per cent of capacity. Quantity deductions on minimum carload lots of formed galvanized roofing and siding were raised 5 cents to 20 cents per 100 pounds. This change affects 26, 27 and 29 gages.

Cleveland—Finishing mill operations in most producers' plants are still erratic, geared to actual requirements. Little improvement in stabilization of mill operating schedules is expected until volume releases from auto builders and other big consumers develops. Sellers report that inventories of finished products among electric household equipment manufacturers, such as stoves, radios and refrigerators, have been substantially reduced. Current buying is limited to tonnages representing actual requirements and for prompt deliveries. Mill prices continue firm.

Chicago — Sheet sales show only minor variations, being marked by continued poor demand from the automotive industry. Business elsewhere is made up almost entirely of small lots as consumers order for only immediate needs. Business from farm equipment manufacturers remains fair despite recent curtailment in operations.

Boston—Sheet buying is irregular. Most volume is now coming from miscellaneous users, most jobbers having covered with fill-in orders to close gaps in stocks. Scattered car lot orders are being placed by some smaller industrial consumers, but several large users have been buying practically nothing for several weeks.

New York — Sheet buying is expected to take a spurt later in the month as the result of jobber releases. Most warehouses find stocks running low in certain descriptions and as soon as resellers have become more certain as to the trend in prices, they are likely to place some sizable business. It is believed that developments over the next fortnight or so, particularly wage negotiations in Pittsburgh, which began this week, will have an important clarifying effect. Mean-



while, specifications from refrigerator manufacturers continue to improve.

Bethlehem Steel Co. has been awarded approximately 500 tons of 24-gage steel for license tags by the New York state division of standards and purchase. The award involved 90,000 strips of one size and 50,000 strips of another. The price was 4.14c, f.o.b. Auburn, N. Y., or 3.84c, basing point. This price was the same as was done on a similar tonnage last December.

Philadelphia — Consumers usually taking large tonnages remain out of the market. Automotive, radio and stovemakers are estimated to be operating at not more than 20 per cent. The stove business, which should be showing seasonal gains, remains in the doldrums although the housing program makes more distant prospects brighter. Jobbers are placing some orders but all for rush shipments.

Buffalo — Depleted status of jobber inventories is reflected in a mild improvement in demand for sheets. Aggregate sales continue in sub-normal tonnage volume as reordering is restricted to immediate requirements. Buying is slightly above the tailend of last year.

Cincinnati—Steady gains in sheet bookings in the last few weeks lend encouragement to the market. Buying has been broad with moderate renewal of specifications from automobile manufacturers and exceptional seasonal activity in galvanized. Prices are firm.

Birmingham, Ala.—With roofing as the major sustaining force, production of sheets maintains a satisfactory pace. Mills report the gradual increase in demand evident immediately after inventories, is maintained.

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Strip

Strip Prices, Page 85

New York—Until the outlook on wages and prices is cleared, the present cautious buying is expected to continue for both cold and hot strip. Incoming volume is made up of a fair number of small orders for prompt shipment. Demand is well spread from miscellaneous consumers with most larger users releasing little tonnage. The spread between actual consumption and buying is narrow.

Boston—Small orders for narrow cold strip are slightly more numerous, but incoming tonnage has not been sufficient to materially change finishing operations which still average about 30 per cent. All specifications are for prompt delivery and well diversified as to consuming industries, although some of the largest, notably those connected with the automobile trade, are buying sparingly. The character of buying increasingly tends to confuse rolling schedules, which are uneven, notably hot mill operations. Prices are steady and unchanged.

Philadelphia — Job stampers are figuring on more work but definite action in many instances is delayed, due to hesitancy over prices. Some miscellaneous business is coming out from day to day but orders are small individually and for prompt delivery, indicating low stocks.

Cleveland—Sellers of hot or cold-rolled strip note little change in daily run of miscellaneous specifications. Order volume has generally improved during January, but individual tonnages involved remain disappointing. This month the same situation exists, with releases from auto partsmakers still at the low level of 30 days ago and showing little sign of improving. Requirements from miscellaneous electrical equipment manufacturers have increased slightly as excess stocks of

finished products become liquidated.

Chicago—Strip demand shows no improvement, and in view of anticipated quiet in automotive operations during the last 30 days, little change in strip production is in early prospect. Consumers' stocks are low, but orders are measured by immediate needs.

Birmingham, Ala.—Production of strip continues on a hand to mouth basis. Buying is extremely light and scattered.

Plates

Plate Prices, Page 84

New York—Local yards apparently were not successful on the 12 cargo boats on which bids were also opened last week by the United States maritime commission in Washington.

With these above proposals likely to be settled in the relatively near future, particularly the tankers, plate sellers would not be surprised if heavy orders for plates are closed before the end of this month, including some substantial tonnage for the tankers placed early last month by the Standard Oil Co. of New Jersey.

Plate demand otherwise is featureless, except for a fairly steady flow of specifications from oil companies for plant maintenance. This week, Feb. 10, bids go in on a sizable tonnage of steel pipe, with some sizes ranging up to 66 inches in diameter, for the local water department.

Pittsburgh — Recent placing of $8,000,000 in government orders for armor plate will give an impetus to the plate market in this district. The award was split by Bethlehem Steel Co., Bethlehem, Pa., Midvale Co., Nicetown, Pa., and Carnegie-Illinois Steel Corp., Pittsburgh, on a 50-30-20 proportion. It is anticipated that further armament program will increase the activity in the Pittsburgh area.

Cleveland—Plate sellers note little change in general market conditions with railroads buying only for miscellaneous needs while waiting for a favorable decision on the increased freight request. Other miscellaneous requirements for ship repairs and small structural projects continue unchanged at comparatively low levels. Distributors are somewhat better off than producers, due to irregular rolling schedules of the latter. However, sellers report that shipments have increased somewhat since the first of the year and expect a continued improvement through the remainder of the quarter.

Chicago — Plate mill schedules continue light, with deliveries ranging from a week to ten days. Consumption is best maintained among structural and tank fabricators. Railroad requirements are at a low ebb, though some material is moving for car repair purposes. Local mills are expected to furnish a large part of the 8000 tons of plates required for Grand Coulee dam penstocks.

Boston—By thoroughly covering their customers, some plate sellers are developing a few car lot orders, but general demand is light with most consumers uncertain as to future requirements. For the long pull shipbuilding outlook is bright for both private and navy yards. The Fore river, Quincy yard, was the only New England bidder on the 12 maritime commission ships. Boiler, structural and most shops fabricating plate material are operating unevenly, a few structural fabricators excepted, notably the Everett, Mass., plant.

Philadelphia — Business is currently light and in many instances barely sufficient to balance open-

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hearth schedules. Some holdups on plate releases by district shipyards are noted and the trade is somewhat disappointed over prospects for delay in the merchant ship program. The oil industry currently is placing little business. Much of the present light miscellaneous business is coming from tank builders.

Seattle — While no large projects are up for figures, shops report increased inquiry for small jobs, boilers and tank work. Several cities are planning steel water tanks and towers. Seattle Boiler Works is low for furnishing a storage tank and tower for Harrington, Wash., involving about 50 tons.

Plate Contracts Placed

8000 tons, steel penstocks and pump-inlet pipes, Grand Coulee Dam, Columbia Basin project, Washington, to Western Pipe & Steel Co., San Francisco, bids Jan. 6; work involves three 72-inch penstocks and eighteen 18-foot diameter penstocks and the erection of penstocks in place in the dam, except the upstream section of each the furnishing of twelve 14-foot diameter pump-inlet pipes and the making of all field welds after they are placed in position by the construction contractor.

185 tons, 1,000,000-gallon elevated water tank, Goldsboro, N. C., to R. D. Cole Mfg. Co., Newman, Ga., $73,100; bids Jan. 26.

100 tons, 200,000-gallon standpipe, Union Springs, N. Y., to Pittsburgh-Des Moines Steel Co., Pittsburgh; W. T. Field Engineering Co., Watertown, N. Y. engineer, bids Jan. 28.

100 tons, approximate, marine boiler plate, bureau of supplies and accounts, navy department, delivery eastern yards and Puget Sound, Wash., to Central Iron & Steel Co., Harrisburg, Pa.; bids Jan. 7, schedule 2445.

Plate Contracts Pending

365 tons, two lighthouse tenders, department of commerce, Washington, for service in 7th lighthouse district, Florida, and 4th district, Delaware Bay. Bid forms also provide for possible construction of third tender.

Unstated tonnage, three 47 x 18 x 3 foot steel pipe line barges, pontoons; bids Feb. 18 to U. S. engineer, Rock Island, Ill., cir. 192.

Unstated tonnage, two welded steel dump barges, each with four pontoons; bids Feb. 16, U. S. engineer, San Francisco, cir. 93.

Bars

Bar Prices, Page 84

Cleveland—Farm equipment manufacturers continue the largest users of carbon and alloy steel bars. However, some curtailing in operations is noted as many are revising estimates of the eventual spring demand. Auto partsmakers and suppliers, usually the largest consumers, are still operating under substantially reduced schedules as auto builders show little interest in issuing releases against former orders. Until the bank of finished parts in most suppliers' warehouses begin to move, sellers can expect little increase in demand.

Chicago — Farm equipment manufacturers continue to furnish best demand for bars despite some recession in operations, which has cut schedules of most plants to four days a week. Automotive bar sales and shipments continue slow. Miscellaneous bar consumers show little change in purchases or specifications.

Boston—Demand for carbon, alloy and forging bars is in small lots for prompt shipment with aggregate volume lowered by absence of buying by most large consumers, notably railroads. Evidence is plentiful that orders for bars and other steel products have been compiled, but held up awaiting developments. Machinery builders and makers of industrial specialties are still frequent buyers of alloy stock in small lots.

New York — Specifications for bars continue to come principally

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from machinery builders and oil companies, and from jobbers. However, purchases are still limited in all cases to nearby needs, and once the outlook with respect to prices becomes clarified, there should be an appreciable increase. Jobbers, in particular, should do some substantial buying once this question is settled and there is a possibility that this may come soon, for wage negotiations, which get under way in Pittsburgh this week, are likely to have an important bearing.

Philadelphia — Volume of orders for steel bars has not expanded materially, although it is at about the same rate as during the last half of January. Buying is well diversified but activity of machinery builders is the brightest spot. Makers of small tools are also active. Prices appear steady.

Birmingham, Ala.—While orders for bars are in better proportion to production than for several weeks, the demand anticipated for this season of the year has not been forthcoming. Some improvement, however, in inquiries, is reported.

Pipe

Pipe Prices, Page 85

Pittsburgh—Operations on tubular goods continue on about the same basis. Stocks in most cases are fairly well prepared for spring business, with some gaps still being filled.

Cleveland—Jobbers report stock turnover during January showed a moderate improvement on percentage basis but is still substantially below normal. Little real increase in demand is expected until a substantial gain in industrial expansion and repairs develops. Producers have revised prices on light wall electric metallic conduit from 4.15c to 3.53c per 100 feet, on ½-inch. Other sizes were revised in the same proportion. Cast iron pipe foundries continue on a two or three-day weekly schedule.

Chicago—Several new inquiries help to bolster lagging activity in the cast pipe market. Milwaukee will purchase nearly 2000 tons of pipe and fittings, while Minneapolis is taking bids on 600 tons. Several other inquiries are in prospect, but diversified demand still is lacking. Shipments against old orders are light, and backlogs are off seasonally.

New York—Shipments against a substantial part of current fill-in cast iron pipe buying are made from stock with the result foundry backlogs are being materially lowered and in some instances operations have slowed. Municipal inquiry for spring shipment has been small. Utilities indicate purchases this year will be for routine requirements and probably about in line with last. Union Springs, N. Y., is closing, through a contractor, on several hundred tons.

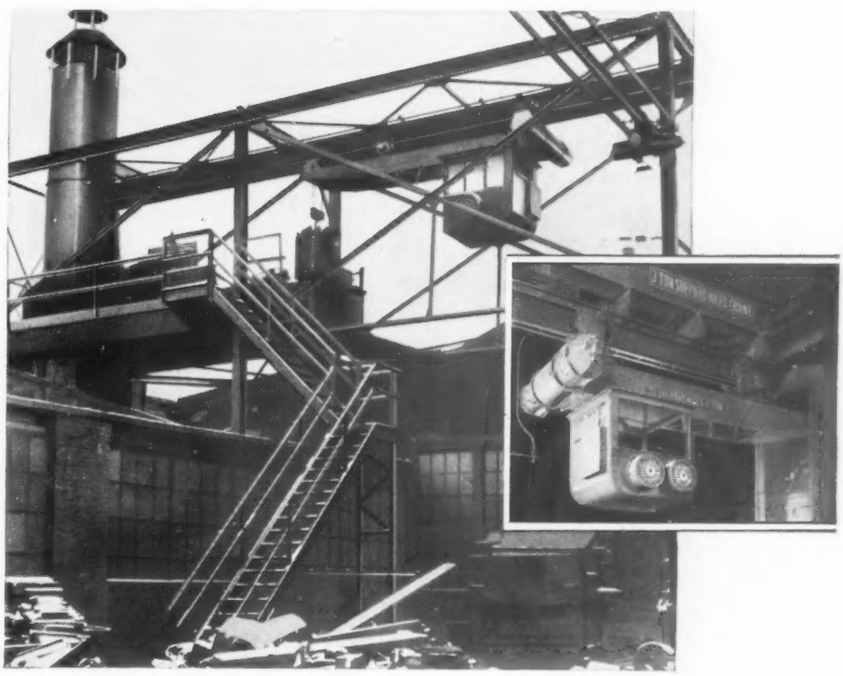
Birmingham, Ala.—Pipe plants continue to operate on three and four day schedules for approximately 40 per cent of capacity. No appreciable business has developed from recent inquiries, although a number of small orders are being booked.

Tulsa, Okla. — Oklahoma Pipe Line Co. has been awarded contract for about 21 miles of eight-inch diameter pipe from Ardmore, Okla., north. It will be oxyacetylene welded by the Lindweld method.

San Francisco—Demand for cast iron pipe is showing improvement and awards totaled 1490 tons. This brought the year's aggregate to 2169 tons as compared with 2250 tons for the corresponding period in 1937. United States Pipe & Foundry Co. was awarded 918 tons of 4 to 12-inch pipe for the La Mesa, Lemon Grove and Spring Valley Irrigation district, La Mesa, Calif., and

BETTER CASTINGS AT LESS COST PER TON

... with SHEPARD-NILES CUPOLA CHARGING HOISTS



● Each charge is lowered in place, not dropped. Uniformly layered charges insure more even distribution of heat. Expensive charging floors are eliminated. Cupolas are charged faster and with fewer men—LESS cost per ton.

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Behind the Scenes with STEEL

Poems Are Made

■ Every time we think we have a fine promotional story to squeeze into this corner, something turns up to take the edge off it. For instance, Uncle Sam's been trying to complete his file of STEEL issues for the Library of Congress and posterity—a noble cause in itself. Two issues were missing—March 1 and April 26, 1937—and since extra copies of these issues couldn't even be located in STEEL's files, Uncle S. suggested we appeal to our readers for these historical documents (story No. 1). The following week, of course, we could then publish a nonchalant little item about how thousands has rushed to our collective aid with the desired copies (story No. 2). But there's no use in mentioning it now; the circulation dept. prematurely discovered the two issues hidden in an old file where Shrdlu stores his used razor blades, empty tobacco tins, and cigar coupons.

Bragging Again

■ We know we're not the only ones to get letters from far corners of the globe or on impressive letterheads, but recently we did get a formal note from the League of Nations thanking us for the copy of STEEL's big ann —but, we promised not to mention that issue again. Just imagine the League, though, in a session extraordinaire, with the delegates climbing all over one another so they could get at the market section and figure out what nation could afford to start the next war, based on our prices.

Confidential

■ Just to show that the RSD isn't the only bunch with the readers' welfare at heart, we thought we'd explain to you the editorial time table that schedules the appearances of such departments as Power Drives, Metal Finishing, New Metal Products and Heat Treatment. The dope is that Power Drives and Metal Finishing appear every other week in STEEL, alternating with New Metal Products and Heat Treatment. The other departments, such as Progress in Steelmaking, Materials Handling, Industrial Equipment and Mr. Kinkead's Welding Etc. are, of course, regular weekly features. And in case you wondered what became of Surface Treatment and Finishing of Metals—well, visualize yourself as an artist trying to cram all those words into one smart-looking label head, and you'll realize why the name was shortened to Metal Finishing. With this issue, New Equipment blossoms out with a label head, too, and for artistic reasons becomes Industrial Equipment. We might have called it Recently Developed or Improved Gadgets and Things for the Shop and Factory, but again the art department would rear up on its haunches and suggest we try to stuff all those words into one label head.

War Resembles Heck

■ Add business addresses subject to change without notice: National Research Institute of Engineering, corner of Brenan and Yuyen Roads, Shanghai, China. The institute is a regular subscriber to our little gem of industrial journalism, though, and just the other day we wrote them a note about some matter or another, hoping they get it before a direct hit is scored on their mailbox. Now we've a suspicion that jokes about Shanghai and bombs might be as stale as that old gag about "So you're from Chicago? Let's see your bullet wounds." Nevertheless, we hear that just the other day the Japanese bombed a Shanghai publishing house. Is nothing sacred?

—SHRDLU

two lots for the treasury department, San Francisco, involving 351 tons. Bids have been opened on 125 tons for the Panama Canal, schedule 3325.

Seattle — French pipe is again a factor in this territory, Junction City, Oreg., and Pasco, Wash., have awarded 160 tons and 90 tons respectively to the Pacific Water Works Supply Co., Seattle. Grandview, Wash., has called bids Feb. 8 for 3200 feet of 4 to 10-inch pipe and fittings for an irrigation project. Reclamation bureau, Denver, is considering bids for 780,000 feet ¼ to 2-inch steel tubing, 500,000 feet 1-inch black steel pipe, bends, couplings and conduit box covers for the Coulee project. PWA has approved a $35,400 water system improvement at Twisp, Wash., Stephen Jayne, Twisp, engineer.

Cast Pipe Placed

918 tons, 4 to 12-inch, La Mesa, Lemon Grove and Spring Valley irrigation district, La Mesa, Calif., to United States Pipe & Foundry Co., Burlington, N. J.

250 tons, French pipe, for Pasco, Wash., and Junction City, Oreg., to Pacific Water Works Supply Co., Seattle.

190 tons, 6-inch, Class 150, treasury department, San Francisco, invitation 4950, to United States Pipe & Foundry Co., Burlington, N. J.

161 tons, 6-inch, Class 150, treasury department, San Francisco, invitation 4940, to United States Pipe & Foundry Co., Burlington, N. J.

Cast Pipe Pending

1800 tons, 6 to 16-inch, class C, 101 special castings and 250 fire hydrants, Milwaukee; bids Feb. 17.

310 tons, 4 and 6-inch, cast iron or alternate, Oak Grove, Oreg.; bids opened.

200 to 250 tons 6 to 12-inches for Spokane, Wash.; bids in.

125 tons, Panama Canal, schedule 3325; bids opened.

Steel Pipe Pending

Unstated tonnage, 100 13-foot lengths, 20-inch i. d. steel shore pipe; bids Feb. 10, U. S. engineer, Portland, Oreg., cir-356.

2000 tons, various sizes of pipe and fittings, Milwaukee; bids Feb. 17.

600 tons, various sizes, Minneapolis.

Wire

Wire Prices, Page 85

Pittsburgh—Inertia in the automotive industry is still felt in manufacturers' wire and merchant wire producers report small gains from a wire variety of sources. The latter are in large measure due to building stocks in anticipation of spring buying.

Cleveland—Jobbers of merchant wire products continue to order for fill-in purposes only, as the rate of

turnover of their own stocks has failed to show substantial improvement. Inventories of most distributors are said to be the lowest in many months. However, in certain items, such as nails, a few jobbers still have excessive stocks. Departmental operation in most mills is highly erratic, geared to almost daily requirements. Mill prices are unchanged.

Chicago—Wire demand is fairly steady, but business in manufacturers' material still suffers from quiet in the automotive industry as well as among miscellaneous consumers. Expectations are for fairly active spring demand for merchant wire products, but distributors are cautious regarding accumulation of stocks.

Boston — With several of the largest consuming industries buying little, notably the automobile trade, producers of wire products are barely able to hold finishing operations, which are spotty, at 25 to 30 per cent of capacity. Individual specifications are small, but well diversified, with no forward buying. Prices are firmly held, most current volume being placed with price no factor in the release.

New York—With manufacturers' wire and most other wire products lagging, the recent slight improvement in demand for merchant products holds, notably in the south. In general, however, there has been slight change in the volume of incoming business, most consumers releasing small-lot orders for prompt delivery with no forward buying. In the east, one producer has reduced mill wages 20 per cent, now effective in its plants at Worcester, Clinton and Palmer, Mass., and Buffalo district.

Birmingham, Ala.—Demand for wire products is maintaining the slight but steady increase of a couple of weeks ago and, with sheets, constitutes the bulk of business at the moment, rails, of course, excepted.

Rails, Cars

Track Material Prices, Page 85

Scattered buying of rails and rolling stock continues, though most requirements are being held back until the rate question is settled. Whether the higher rates, if granted, when applied on present reduced traffic volume, will afford income sufficient to meet needs is a question.

New York, New Haven & Hartford has followed its inquiry for 50 passenger cars and six locomotives by request for bids on 7580 tons of rails. This road also plans to repair and modernize 150 passenger cars. Court approval has been given for the purchase of cars and locomotives and the cars have been placed with Pullman-Standard Car Mfg. Co., Chicago.

Missouri Pacific has been authorized by the federal court to buy 43,318 tons of 90 and 112-pound rails, with a considerable tonnage of accessories, and to undertake a program of repair. Canadian National has placed six locomotives with Lima Locomotive Works, Lima, O.

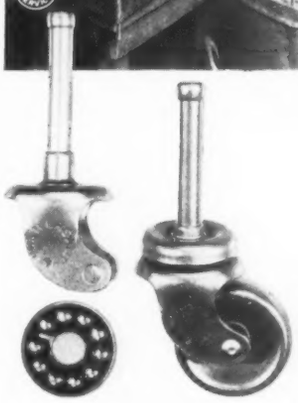
Reliable report is that the Western Maryland will soon reinstate its inquiry for 500 hoppers, 500 box cars and 100 gondolas.

Rail Orders Placed

Board of Transportation, New York, 2000 tons, open hearth contact and guard rails, extension city independent railroad to world's fair site, New York, to Bethlehem Steel Co., Bethlehem, Pa., only bidder, Feb. 1; of total 1285 tons are open hearth rails.

Rail Orders Pending

Missouri Pacific, 43,318 tons 90 and 112-pound; also considerable tonnage of



The press shown is a Ferracute P2, three of which are used for assembling ball bearings on caster stems. The operator places the ball race in the die, inserts the stem of the horn through the hole in the race, trips a lever which automatically feeds the balls into the race, then trips the foot lever and the die shears and forms a shoulder on the stem, producing a collar which holds the balls in place.

22

A MINUTE

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Assembling ball bearing caster stems is a precision job, and one requiring speed. One manufacturer using three Ferracute P2 type presses averages twenty-two assemblies per minute, per press.

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accessories; Federal court authority given for expenditure.
New York, New Haven & Hartford, 7580 tons; bids asked.

Shapes

Structural Shape Prices, Page 84

New York—Less structural steel is coming out for estimates, bridge requirements especially lagging. New inquiry includes 650 tons for two New York city school additions, while awards involve 950 tons for ramps, west side elevated highway. There has been a decided drop in private construction. The larger structural projects are bringing out unusually low fabricated and erected prices in most instances.

New business booked by the structural steel industry in 1937 totaled 1,628,641 tons, an increase of slightly above 1 per cent over the preceding year, according to the American Institute of Steel Construction. Shipments last year were 1,660,570 tons or 59.2 per cent of normal (the yearly average for the period 1928-31 inclusive). Shipments in December were 46.3 per cent of normal. New business booked in December was over 10 per cent below the yearly average. Totals for December were: Bookings 99,070 tons, and shipments 108,396 tons.

It is interesting to note that STEEL's final structural award figures for the same period, appearing in Dec. 27 issue were 1,209,072 tons against the institute's total of 1,628,641 tons. The difference represents the numerous small projects under 100 tons which STEEL makes no attempt to report.

Pittsburgh — Inquiries are more numerous than formerly, although generally they are quite small. Total awards aggregate approximately 11,000 tons. Tennessee Valley Authority, Sweetwater, Tenn., has awarded 1350 tons to American Bridge Co., Pittsburgh, for transmission towers.

Cleveland — Structural awards continue limited to small miscellaneous projects, well under 100 tons. Both private and public work has failed to show the expected improvement since the first of the year. A number of industrial expansion programs are being delayed, waiting for a more favorable trend in general business and more definite decision on prices. A considerable tonnage is also involved in bridges and other improvements for the state of Ohio, on which bids have already been taken. Mill prices are unchanged but fabricated material continues to show the effect of a keen competitive market.

Chicago — Fabricated structural awards and inquiries hold at their recent slow rate, and fabricators are ordering plain material only for specific jobs, with little steel going into stocks. Bids on the Clarksville, Mo., dam have been postponed until Feb. 18.

Boston — Readvertised bids close this week on the 600-ton Spaulding high school, Rochester, N. H. Most pending projects are confined to public work, including schools, several new college buildings and an armory, Machester, N. H. Bridge inquiry is low even for this season. For bridges last year Maine spent $1,992,871.98; New Hampshire, $535,054.49; Vermont, $513,417.70, and Rhode Island, $57,855.68, based on contracts compiled by Frederick Hoitt, secretary, New England Road Builders association.

Philadelphia — More state work is coming out involving several thousand tons. Bids are due Feb. 8 for Stroudsburg state school; Feb. 23, Warren hospital; Feb. 15, Scranton hospital. McCloskey & Co., Philadelphia, are low on part 2, Morristown state hospital. Bids are also due Feb. 23 for a hangar, Bollingfield, Wash., involving 650 tons. Private work is still slow.

San Francisco — Interest in the structural market centers on the outcome of bids, just opened, for from 1700 to 5000 tons of sheet piling, for the improvement of the Alameda, Calif., water front for the navy department. Golden Gate Iron Works has booked 250 tons for an apartment in San Francisco.

Seattle — Largest job definitely up for figures is the Washington-Idaho state bridge over the Snake river, bids at Olympia, Wash., March 1. The project involves 1025 tons of shapes, 47 tons machinery and 19,500 feet of steel piling. Concrete approaches are specified. Tacoma has rejected bids for two transfer cranes and three hoists for the water department shops and will call new tenders soon. Fabri-

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Shape Awards Compared

	Tons
Week ended Feb. 5	10,264
Week ended Jan. 29	16,507
Week ended Jan. 22	23,094
This week, 1937	17,095
Weekly average, year, 1937	16,060
Weekly average, 1938	15,169
Weekly average, January	17,978
Total to date, 1937	175,424
Total to date, 1938	91,012

Includes awards of 100 tons or more.

cating shops have a fair amount of work on hand.

Shape Contracts Placed

1832 tons, bridge, Hennepin, Ill., to Bethlehem Steel Co., Bethlehem, Pa.

1350 tons, transmission towers, Tennessee Valley Authority, Sweetwater, Tenn., to American Bridge Co., Pittsburgh.

950 tons, ramps, west side elevated highway, 133-136th streets, New York, to Bethlehem Steel Co., Bethlehem, Pa.; George F. Driscoll Co., Brooklyn, general contractor.

900 tons, repairs to highway bridge across the Missouri river at St. Charles, Mo., to Fort Pitt Bridge Works, Pittsburgh.

535 tons, Sag channel bridge, Cook county, Illinois, to Wisconsin Bridge & Iron Co., Milwaukee.

420 tons, bridge, Bernalillo, N. Mex., to American Bridge Co., Pittsburgh.

340 tons, underpass, Madison avenue and Exterior street, Bronx, N. Y., to American Bridge Co., Pittsburgh; through Knight & Timoney Inc., Bronx, general contractor.

270 tons, combined railway and highway bridge, Consumers Power Co., Comstock, Mich., to American Bridge Co., Pittsburgh.

255 tons, beer storage building, Detroit, to R. C. Mahon Co., Detroit.

250 tons, apartment, San Francisco, to Golden Gate Iron Works, San Francisco

250 tons, Wilson Canyon bridge, Coconino county, Arizona, to Minneapolis-Moline Power Implement Co., Minneapolis.

250 tons, highway bridge, Moberly, Mo., to Bethlehem Steel Co., Pittsburgh.

225 tons, Pico street crossing, Union Pacific tracks, Los Angeles, to Columbia Steel Co., San Francisco.

212 tons, bridge, East Market street, over Baltimore & Ohio railroad, Akron, O., to Bethlehem Steel Co., Bethlehem, Pa.

200 tons, five oil derrick, General Petroleum Corp., Long Beach, Calif., to International Derrick & Equipment Co., Los Angeles.

200 tons, gin building and seed house, Holdenville, Okla., to Larrance Tank Corp., Lawton, Okla.

200 tons, steel piling, building foundations, sewage disposal plant, Tallmans Island, New York, to L. B. Foster Co., Inc., New York, through J. Rich Steers, Inc., sub-contractor for Caye Construction Co., general contractor.

185 tons, buildings, teachers college, Shippensburg, Pa., to Reading Steel Products, Inc., Reading, Pa.

185 tons, addition to post office, Pasadena, Calif., to Bethlehem Fabricators, Inc., Bethlehem, Pa.

150 tons, building, Alco Products Inc., Baton Rouge, La., to Decatur Iron & Steel Co., Decatur, Ala.

150 tons, highway bridge, Booneville, Mo., to Reliance Steel Co., Pittsburgh.

150 tons, state bridge FAP 904-B, Gonzales county, Texas, to North Texas Iron & Steel Co., Fort Worth, Tex.

125 tons, library, Morgan college, Baltimore, to Dietrich Bros., Baltimore.

120 tons, building, Western Shade Cloth Co., Los Angeles, to Modern Iron Works, Los Angeles.

120 tons, highway bridge, Monroe County, Illinois, to Wendnagel & Co., Chicago.

105 tons, school, Cheyney, Pa., to Max Corchin, Philadelphia.

100 tons, buildings, Rosewood state training school, Owings Mills, Md., to Maryland Steel Products Co., Baltimore; Davis Construction Co., Baltimore, general contractor.

100 tons, approach, Lincoln tunnel, Weehawken, N. J., to American Bridge Co., Pittsburgh; B. Perini & Sons, Inc., Framingham, Mass., general contractor.

100 tons, school, Yardville, N. J., to N. A. K. Bugbee Co., Trenton, N. J.

Shape Contracts Pending

5900 tons, bridge, Long Island railroad, Lynbrook, N. Y.; rebid estimates in.

3225 tons, Robert White Memorial building, Massachusetts general hospital, Boston; Aberthaw Construction Co., general contractor. Steel for superstructure pending for several months, now taking bids.

1525 tons, also 47 tons machinery and unstated tonnage of piling, Washington-Idaho Snake river bridge; bids at Olympia, March 1.

1200 tons, annealing shop building, American Rolling Mill Co., Middletown, O.

1000 tons, wickets, etc., for Ohio river dams No. 47, 51, 52 and 53, army engineerss' office, Louisville, Ky.

650 tons, airplane hangar, United States army, Bolling field, Washington; bids Feb. 23.

650 tons, public school 89, Bronx, and 32,

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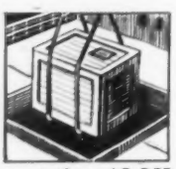

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Chicago Ill. Los Angeles Calif.

Queens, N. Y.; bids Feb. 8, board of education, New York.

600 tons, Spaulding high school, Rochester, N. H.; readvertised Feb. 8, first tenders rejected.

475 tons, administration building, Harvard university, Cambridge, Mass.

420 tons, shapes and plates, bridge, Hamilton county, Ohio; bids Feb. 8.

400 tons, Allentown state hospital, part 2, Allentown, Pa.; bids in.

380 tons, bridge on Yerba Buena island, San Francisco; Heafey Moore Co. and Fredrickson & Watson Construction Co., low on general contract.

370 tons, sheet piling, board of public service, St. Louis, for Maline creek channel protection.

370 tons, five state bridges, Illinois; bids Feb. 8.

318 tons, bridge for San Pedro branch line of Southern Pacific Co., for United States engineer office, Los Angeles; bids opened.

300 tons, bridge, Toledo, O.; new bids Feb. 15.

285 tons, high school, Westhampton Beach, N. Y.

280 tons, freight transport shed, Honolulu, Hawaii.

250 tons, power house, at state prison, Jefferson City, Mo.

230 tons, junior high school building, Cynwyd, Pa.

230 tons, grizzly beams, Climax Molybdenum Co., Climax, Colo.

210 tons, addition, St. James Episcopal church, New York.

200 tons, store, S. H. Kress Co., Austin, Tex.

200 tons, steel bearing piles, North Beach airport, New York; bids in, Feb. 7, procurement division, treasury department, New York.

200 tons, building, Pfeiffer Brewing Co., Detroit.

190 tons, Norristown state hospital, part 2, Norristown, Pa.; McCloskey & Co., Philadelphia, low.

180 tons, bridge, contract 1600, Martinsville, Ind.

150 tons, state bridge, contract 1609, Cannelton, Ind.

125 tons, building, City Island Boat Building Co., New York.

Reinforcing

Reinforcing Bar Prices, Page 85

New York—Including 530 tons of highway mesh, reinforcing steel awards approximate 1000 tons as contractors continue to hold off closing contracts on the bulk of pending requirements. New inquiry includes several hundred tons for the Meeker avenue bridge approach piers, Brooklyn, closing Feb. 15. Highway mesh requirements are the smallest in months, only a few hundred tons pending in New Jersey. Awards include the Bronx, N. Y., municipal garage, 225 tons.

Pittsburgh—Recent inquiries and awards are quite light and there is no indication as to how heavy spring business will be. Wayne county road commission, Detroit, has awarded 688 tons for a grade elimination project at Trenton, Mich., to Great Lakes Steel Corp., Ecorse, Mich.

Cleveland—The city of Cleveland is expected to advertise soon for considerable tonnage of reinforcing bars for piers and abutments of the Main street bridge. Plans on this portion of the bridge have been completed and are awaiting PWA approval. With this exception little tonnage is under immediate consideration. Private work is limited to small tonnages and comparatively little tonnage is involved in miscellaneous bridge requirements. Fabricated prices continue shaded, but not to the degree reported in other sections of the country.

Chicago—While a number of fairly large jobs are pending, orders have been confined principally to small lots. Public building projects, including highways and river dams, are expected to account for several thousand tons during coming weeks. Hesitancy is noted in private construction and few major inquiries of this nature are pending.

Boston—Lack of bridge and highway requirements is curtailing inquiry for reinforcing steel. While needs for building construction are slightly heavier, including several projects taking more than 100 tons each, public work predominates. Contractor-buyers are still slow to close, seeking concessions from the 2.95c, delivered, price. Highway building programs in the six New England states are uncertain.

Philadelphia—Some state work is coming out, although it is noted that contractors have not let steel on a number of projects, preferring to wait until material is actually needed. Fabricators' backlogs show further reduction, since state jobs are not sufficient to offset decline in industrial, store and other private work.

San Francisco—Reinforcing bar market is most active one at present with 3608 tons placed, bringing the aggregate for the year to 13,228 tons, compared with 3423 tons for the corresponding period in 1937. Unnamed interest took 250 tons for an addition to the Broadway department store, Los Angeles. Bids open March 1 for the inter-state bridge, Washington-Idaho, involving 692 tons.

Seattle—Inquiry for reinforcing

Concrete Bars Compared

	Tons
Week ended Feb. 5	5,931
Week ended Jan. 29	5,211
Week ended Jan. 22	1,798
This week, 1937	683
Weekly average, year, 1937	6,266
Weekly average, 1938	5,856
Weekly average, January	6,446
Total to date, 1937	16,294
Total to date, 1938	35,135

Includes awards of 100 tons or more.

bars is somewhat improved, most of it for public works projects. Rolling mills are operating as occasion demands. Largest recent award was 1700 tons awarded to Columbia Steel Co. at $88,887 by the reclamation bureau, materials for the Coulee dam. Washington state will receive bids March 1 for the Washington-Idaho bridge involving 692 tons. Frank Watts, Portland, has been awarded a railroad crossing at Hood River, Oreg., by the war department, bidding $36,122. Reinforcing prices remain firm.

Reinforcing Steel Awards

1030 tons, for use in American canal, Southern California, to Bethlehem Steel Co. San Francisco.

688 tons, grade elimination, Trenton, Mich., for Wayne county road commission, Detroit, to Great Lakes Steel Corp., Detroit.

500 tons, municipal building, Oklahoma City, Okla., to Sheffield Steel Corp., Kansas City, Mo.

350 tons, psychiatric hospital, Pittsburgh, to Sweets Steel Co., Williamsport, Pa.

300 tons, highway RC-3932, Plattsburg, Cadyville and West Plattsburg route, Clinton county, New York, to Bethlehem Steel Co., Bethlehem, Pa.; William F. Yakey, Rochester, N. Y., general contractor; bids Jan. 4, Albany.

275 tons, municipal auditorium, Charleston, W. Va., to West Virginia Rail Co., Huntington, W. Va.

275 tons, bridge over Elk river, Charleston, W. Va., to West Virginia Rail Co., Huntington, W. Va.

250 tons, addition to Broadway Department Store, Los Angeles, to unnamed interest.

230 tons, mesh, state project RC-3928, Mongaup-Pond Eddy highway, Sullivan county, New York, to American Steel & Wire Co., New York; Lane Construction Corp., Meriden, Conn., general contractor.

225 tons, municipal garage, Bronx, N. Y., to Joseph T. Ryerson & Son, Inc., Jersey City, N. J.; Weiss & Wiensier Co., Brooklyn, general contractor.

220 tons, live stock pavilion, Illinois state fair grounds, Springfield, Ill., to Missouri Rolling Mills Corp., St. Louis.

200 tons, junior high school, Mt. Lebanon, Pa., to Jones & Laughlin Steel Corp., Pittsburgh, through Metzger-Richardson, Pittsburgh.

150 tons, high school, McPherson, Kans., to Sheffield Steel Corp., Kansas City, Mo.

150 tons, ramps, west side elevated highway, 133-136th streets, New York, to Carroll-McCreary Co., Inc., Brooklyn; George F. Driscoll Co., Brooklyn, low.

150 tons, hospital building, Norton, Kan., to Sheffield Steel Corp., Kansas City, Mo.; W. R. Grimshaw Co., Tulsa, Okla., general contractor.

150 tons, addition to post office, Pasadena, Calif., to unnamed interest.

130 tons, school, Bakersfield, Calif., to unnamed interest.

125 tons, highway relocation, Freehold, N. J., to Truscon Steel Co., Youngstown, O.; through E. H. Ellis Inc., Woodville, N. J., general contractor.

118 tons, state teachers' college, Bloomsburg, Pa., to Milton Mfg. Co., Milton, Pa.

115 tons, high school, North Providence, R. I., to Concrete Steel Co., New York; John Bowen Co., Inc., Boston, general contractor.

100 tons, state hospital addition, Phoenix, Ariz., to unnamed interest.

100 tons, pre-cooling plant, Irvine Valencia Growers association, Irvine, Calif., to unnamed interest.

100 tons, school, Cheyney, Pa., to Concrete Steel Co., Philadelphia.

Reinforcing Steel Pending

900 tons, reinforcing bars and H-piles, pier approaches, Meeker avenue bridge, Brooklyn, N. Y.; bids Feb. 15, department of public works, New York.

692 tons, Washington-Idaho bridge; bids at Olympia, Wash., March 1.

475 tons, Queens land section, Queens-Manhattan tunnel; bids Feb. 24 to New York Tunnel authority.

425 tons, surgical building, Massachusetts general hospital, Boston, taking bids.

300 tons, Norristown state hospital, part 2; McCloskey & Co., Philadelphia, low.

265 tons, Norfolk navy yard requisition, Norfolk, Va.; bids in.

181 tons, state highway 43, Cincinnati.

180 tons, bridge, Hamilton county, Ohio; bids Feb. 8.

160 tons, buildings, state prison, Auburn, N. Y.; C. F. Haglin & Co., Buffalo, low.

160 tons, highway RC-3933, Tioga county, New York; Maple City Lumber & Supply Co., Hornell, N. Y., general contractor, bids Jan. 4.

100 tons, bridge, Yerba Buena Island, San Francisco; bids opened.

100 tons, Allentown state hospital, part 2; bids in.

100 tons, garage, Monroe street, Chicago.

100 tons, sewage plant, East Chicago, Ind.

100 tons, Stephen Lee apartment building, Madison, Wis.

100 tons, power house, state prison, Jefferson City, Mo.

Unstated tonnage, school structures, Wenatchee, Wash.; H. S. Wright & Co., Seattle, general contractor.

Unstated tonnage, Olympia, Wash., high school; Standard Construction Co., Tacoma, general contractor.

Unstated tonnage, railroad crossing, Hood river, Oreg., for U. S. engineers; Frank Watts, Portland, general contractor.

Unstated tonnage, piers and abutments, Main street bridge, Cleveland; bids soon.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 85

The market for bolts, nuts and rivets continues quiet and in the lack of major improvement in consumption total business remains at its recent slow rate. Farm equipment manufacturers continue to make the best showing among principal consumers, though requirements of this group have tended downward slightly. Orders from jobbers generally are for small lots and there is no tendency to increase inventories.

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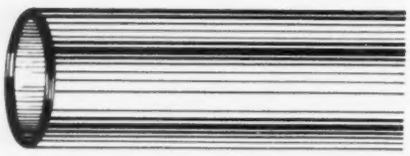

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ORDER FROM STOCK

Pig Iron

Pig Iron Prices, Page 86

Pittsburgh—Production for January was better than December but still is far from satisfactory. Although the outlook is not especially optimistic, inquiries continue to enter the market, giving enough stability to enable producers to lay definite plans for the immediate future. This condition is obviously the result of general depletion of inventories.

Cleveland—Little change is noted in the pig iron market, with foundries operating on two or three-day weekly schedules and ordering only for actual requirements and for prompt shipment. However, producers report that total shipments during January were approximately 10 per cent more than in December. Some expect the trend to continue and expand further during February. National Tube Co., Lorain, O., has banked another furnace to operate only one out of five. Prices remain firm.

Chicago—New pig iron business is made up principally of single carload orders, and the carryover of tonnage ordered last quarter is holding fresh buying to a minimum. Shipments hold around the rate of late January, but February deliveries are expected to show a small increase. Farm equipment foundries continue fairly active despite some letdown in production.

Boston—Foundry demand for pig iron continues slack with scattered shipments in less than car or truck lots. The general situation is unchanged with smaller consumers buying as needed to meet limited requirements and the larger plants drawing on supplies without doing much replacement buying. Prices on domestic business are firm. Considerable export inquiry comes out frequently with some such tonnage evidently offered as a feeler for still lower quotations. Foreign buyers are insisting on concessions and are not placing business until granted, although some buyers are not going all the way in meeting such demands.

Cincinnati—Shipments of pig iron this month show little increase over January, reflecting the light foundry melt. Foundry inventories are low and some spot buying has been done. The more important interests are covered for light requirements by fourth quarter contracts so that furnace interests foresee no immediate tonnage buying movement. Prices are firm on both northern and southern grades.

New York—Pig iron buying continues limited to small hand-to-mouth orders. Consumers generally are operating lightly and are laying in only supplies necessary for immediate needs. January business was slightly in excess of December, and while prospects are not clear for the current month, it is believed that if there is no increase in tonnage it will be due primarily to the fact that February is a short month. Export inquiry is fair, but important sales are few.

Philadelphia — The foundry melt is holding up well with average operations estimated at three to four days weekly. Inventories are being worked still lower but no inclination is noted on the part of consumers to place more than a carlot or so at a time. The last merchant blast furnace in the district has gone out for relining. This interest is reported to have 50,000 tons on hand. Some foreign inquiry is developing but prices are not attractive. Domestic quotations are steady.

Buffalo—Pig iron producers hope the slight expansion in orders is indicative of a reversal of the downward trend. Total shipments are far from satisfactory but a greater number of spot carload orders are being received. Melting operations are holding at the mildly improved level reported last week. Foundries are still working off inventories although orders being placed reveal reimbursing stock is necessary in many instances. Seven out of 15 stacks continue active.

St. Louis—Shipments last week were ahead of the preceding week. Shipments are against contracts, which have been extended into the first quarter. There was little new buying, and this confined to fill-in needs. No sizable new tonnages were placed.

Specifications against contracts and what new business there is are for rush shipments, indicating inventories are low. No large amount of buying during the first quarter is expected. The melt is comparatively light. Agricultural implement trade is going at a high rate, but otherwise business is quiet.

Birmingham, Ala.—While there is a better feeling among pig iron producers not a great deal of improvement is noted in specifications or shipping instructions.

Toronto, Ont.—New business in the pig iron markets is largely confined to spot orders ranging from a car to 500 tons. Melters, however, are showing interest and entering the market at regular intervals. Bookings are on a par with those of comparable period of 1937 and schedule delivery is being made against contract. Spot sales are responsible for movement of some 2000 tons of iron weekly. The daily

melt continues at high level, around 70 per cent, with indications there may be a further gain of about 5 per cent by spring. Some large contracts are pending for steel and their products which are expected to stimulate iron sales later in the year. Pig iron prices are firm an unchanged.

Scrap

Scrap Prices, Page 88

New York — Buying for export predominates in a rather listless scrap market, with prices unchanged. Domestic shipments are light with mills doing little buying. Foundry grades are even duller. After showing slight additional strength for a fortnight stove plate and grate bars tend to be somewhat easier. Export cargo space is freer and most offerings are being loaded promptly without barge storage. In some instances boats stop at several ports to complete loading. It now appears that Japan recently purchased a round tonnage but details are being kept under cover.

Pittsburgh — Present conditions in the Pittsburgh scrap market seem to indicate no lower price will be met. Recent sales made in the $14-$14.50 bracket tend to confirm this. Large tonnages could not be had at this price, however, should demand for them arise. Local prices continue to be bolstered by the export situation. Unprecedented inactivity continues.

Cleveland — Little activity is evident in scrap, with shipments on contracts in small volume. Most of the latter are blast furnace material, with some melting steel. Prices are unchanged, at nominal levels.

Chicago—Scrap prices have weakened as the result of continued poor demand from consumers and quotations on heavy melting steel and several other grades are off 50 cents. Last sales of heavy melting steel were made at $13.50, but sellers now are able to pick up this grade at less than $13, which now represents the top of the consumers' market despite its nominal status.

Boston—Domestic buying of scrap still drags, although Worchester is showing more interest, with the price advanced 50 cents for delivery to that point. The price is still too low to attract tonnage and most activity is for dock delivery export, with boat-loading still brisk in New England. Price changes are few, but mostly upward, No. 2 cast being 25 cents higher for export.

Philadelphia — The market for blast furnace scrap has eased sharply since only one district consumer continues in the market, and some business has been done at lower prices. No. 2 heavy melting steel has sold at $13.50 in one direction although $14 may be had from another melter. No. 1 heavy steel is steady at $15 with little business done at that level. A monthly automotive list of compressed sheets went at the equivalent of $15. This material is going abroad. A sale of 3000 tons of old compressed sheets for export was at $10, dealer's yard or dock. At least four boats are loading here this month with a total of 20,000 tons of steelmaking grades.

Buffalo — Weakness was noted in the iron and steel scrap market as dealers accepted bid price of $13 a ton for No. 1 heavy melting steel, which previously was rejected. Price reductions of 50 cents to $1 a ton included practically every item. No. 1 material was cut to $12.50-13 a ton with a $2 differential on No. 2 stock, bushelings, drop forge flashings and compressed sheets.

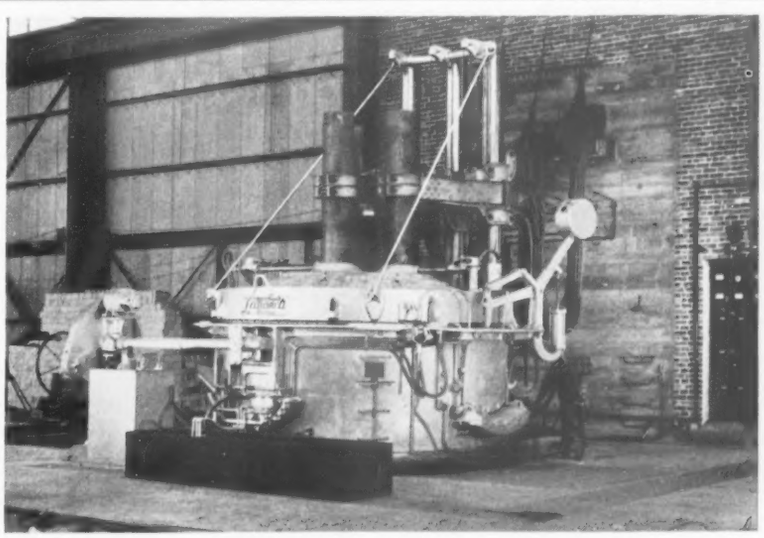
Detroit—Despite reports that recent lists, including Chevrolet and Chrysler, have brought slightly higher prices, it is felt generally this does not represent demand buying and therefore published prices are not being marked up. However, such transactions lend support to the belief additional strength has developed. A test will be the bids received on Fisher lists which come up about Feb. 15.

Cincinnati—Prices of iron and steel scrap are unchanged but nominal in the extremely quiet market. Activity is held to light, miscellaneous sales as dealers mark time. Some mill operations are better, but scrap inventories still prevent a return to the market. Foundries show slight buying interest, only desultory purchases originating there.

St. Louis—The first sale of any consequence of scrap iron since Nov. 13, 1937, when a district melter bought 15,000 tons of heavy melting steel, was consummated with the contract for 1500 tons of this item by a local mill.

The latest transaction was made with several dealers and provides for deliveries in 30 to 60 days. Deliveries will be from local stocks, because of the low prices prevailing, the material could not be brought in and sold at the price paid, which was about $1 a ton lower than the preceding sale.

Birmingham, Ala.—The scrap market has encountered no enlivening factor in several weeks. Foundries



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are taking some small lots, but heavy melting and other desirable items are not in demand at the moment.

Seattle — Prospects are improving in the export field as Japan is easing credits for necessary requirements. Shippers are unable to pay the freights asked by the regular lines for parcel shipments and two or three full cargo ships have been chartered from Pacific coast ports at a rate of about $5 a ton, free in and out. Dealers are looking for revived export trade soon and meanwhile are buying desirable tonnages at their own prices. Rolling mills are still fully stocked and are not interested in buying.

Toronto, Ont.—Trading in iron and steel scrap continues listless with consumers interested in special grades only. Steel mills in the Hamilton district are taking deliveries of heavy melting steel and turnings when offered by dealers, but shipments are somewhat below the average for last year. Adverse road conditions in the north have retarded shipments from the rural districts and dealers are obtaining most of their new supplies from producing plants.

Warehouse

Warehouse Prices, Page 87

Cleveland—Warehouse distributors report aggregate tonnage shipped during January was 10 to 15 per cent better than in December, the lightest month in 1937. Irregular rollings by mills has undoubtedly had a favorable influence on warehouse sales. Distributors note a continued increase in the number of their own customers re-entering the market although on a much smaller scale than six months ago.

Chicago — While sales continue small, the total volume remains moderately above the lowest rate of the past two months. Only a small increase at best is in prospect for February.

Boston—In view of the continued hand-to-mouth buying on the part of most steel consumers, warehouses have benefitted from this policy to a surprisingly small degree. While some ordinary mill business has been diverted to jobbers, the aggregate volume is much lower than might be expected. Jobbers sales are disappointing and some of the most representative have experienced a slump which started during the last two weeks of January. Orders are small individually, but fairly well diversified.

New York — Demand for steel from district warehouses has slumped, most products being effected. Price shading among jobbers appears to be spreading with bolts and nuts being sold under listed discounts. Pipe is moving slowly. Some jobbers still have large inventories of sheets, especially galvanized, and the offerings of seconds further weakens the position of sheets.

Philadelphia — Business this month is running at about the rate of January, which was about 50 per cent under January, 1937. Jobbers are getting some business usually going to mills, due to the present policy to buy against current needs only. The trade reports prices appear more stabilized than two or three weeks ago.

Buffalo — Warehouse business continues to drag with consumers limiting orders to immediate requirements. Agitation for lower prices by the President is believed to be holding up large orders. While prices on hot-rolled and heavy lines are holding firm some weakness is noted in the galvanized sheet market.

Cincinnati—Warehouse sales fail to rise from disappointing levels. Individual orders are light and spotty. February volume so far is close to the January rate, which, in turn, was only slightly better than December. Prices are unchanged and firm.

St. Louis—Effective at once, reductions for quantity will apply on galvanized sheets for delivery from warehouses in the metropolitan area as follows: 10 bundles, 10 cents per hundred pounds; 25 bundles, 25 cents, and 50 bundles, 50 cents.

For shipments outside the metropolitan St. Louis area, the Chicago base and quantity differentials will be maintained.

Seattle — Business continues to drag and volume is small. WPA buying is inactive and spring requirements have not been placed. Prices are firm.

Cold Finished

Cold Finished Prices, Page 85

Pittsburgh — Continued increases from a wide variety of miscellaneous sources have formed the only bright outlook in the cold-finished market. Hopes for business from the automotive trade seem to have vanished, for the present at least. It is believed this situation will continue through this quarter with a gradual increase in small orders.

Tin Plate

Tin Plate Prices, Page 84

Pittsburgh — Food cans are expected to take their normal tonnage of tin plate this year, according to reports gathered at the canners' convention recently closed in Chicago. Should present conditions continue, however, manufacturers' cans would show a decided drop. Operations in this district are holding up fairly well, being estimated at 38 per cent. Activity is mostly in hot mills, with cold mill operations somewhat spasmodic.

New York—While still limited, an improvement is noted in tin plate demand. Recently, for the first time this year, certain larger consumers have closed on fair ton-

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nages for March and April shipment and some smaller local consumers, whose stocks are now running low, are again feeling out the market. Some of these latter are understood to have stocks sufficient to last them only to the end of this month at their present restricted rate of fabrication. Export inquiry is showing little life, there having been only a limited volume for the past three months or so, after one of the most active periods in recent years.

Iron Ore

Iron Ore Prices, Page 88

New York — Foreign manganiferous ore, 45-55 per cent iron and 6-10 per cent manganese, is slightly higher on a recent transaction and may now be quoted at 12c to 13c, alongside docks, Atlantic ports, against 12c recently.

This is somewhat contrary to the general trend of foreign ore prices at present. Most ores are nominally unchanged, but, on anything like attractive tonnage, lower, it is believed, could be done. Most consumers are well stocked, considering the present rate of consumption, and with ocean rates increasingly easy, they are showing little interest.

Steel in Europe

Foreign Steel Prices, Page 87

London — *(By Radio)* — Iron and steel markets in Great Britain are generally quiet. Production continues at a high level, gradually catching up on backlogs. Some foundry pig iron is being placed in stock. The structural and engineering trade is pressing for steel deliveries. Sheets and tin plate are quiet.

The Continent reports export trade is dull. A cartel has been formed in cold-rolled strip on the basis of £10 17s, gold.

Ferroalloys

Ferroalloy Prices, Page 86

New York — Ferromanganese specifications are starting the new month slowly, and in some quarters it is doubted if the movement in February will much exceed that of January, which in turn was slightly better than December. February, it is pointed out, is a short month and expansion in steelmaking operations is expected to be slow. There should be a perceptible pickup in March, however, if there is to be any early expansion in steelmaking operations, for by that time spring seasonal influences will have had an opportunity to work.

Prices, meanwhile, are unchanged at $102.50, duty paid, Atlantic and Gulf ports, with the outlook for further steadiness over the remainder of this quarter. What action may be taken around the middle of March, when second quarter prices are likely to be announced, remains to be seen.

Domestic spiegeleisen, 19 to 21 per cent, also is steady at $33, Palmerton, Pa., and 26 to 28 per cent, at $39. All other leading ferroalloys also are unchanged, with sales still restricted by the light volume of steel production.

Nonferrous Metals

Nonferrous Metal Prices, Page 86

New York — Optimism which was prevalent in nonferrous metal markets during the first few days of last week disappeared by the weekend. American political developments continued to weigh heavily on the markets and overshadowed other factors. Due to uncertainties inherent in the present industrial picture, consumers continued to show little interest in making new commitments. Prices, however, held unchanged with the exception of narrow fluctuations in tin.

Copper—Export copper advanced steadily during the early part of the week but declined to 9.70c, c.i.f., by the week end. Any increase in buying must await a pickup in orders for copper and brass fabricated products. All first hand sellers quoted electrolytic at the flat price of 10.00c, Connecticut.

Lead — Sales were restricted to carlots with prices unchanged at 4.75c, East St. Louis, and 4.90c, New York. Total lead stocks increased 13,967 tons during December to 208,803, the highest level attained since April 1, 1937.

Zinc — Some speculative interest in futures was noted in an otherwise dull market. Prime western held at 5.00c, East St. Louis. High grade zinc was quoted at 6.00c, delivered, as of Feb. 1. An expected increase of around 6000 tons in stocks of all grades during January is believed to have been discounted pricewise.

Tin — Interest centered in purchases by the navy which has awarded contracts for 360 long tons during the past month. The navy is expected to make further heavy purchases, including 90 long tons, bids for which will be opened Thursday, Feb. 11. Straits spot closed at 40.50c.

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"A" is a special alloy Erie stud made for a customer whose specifications called for resistance to high temperatures.

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Many Plans Going Ahead

(*Continued from Page 25*)

Inc., has spent $75,000 in building and $35,000 in machinery recently. Additional expenditures are likely to reach $150,000.

Eastern States Milling Co. is completing new $250,000 plant, and cost of new machinery will be $100,000.

International Harvester Co. has bought an entire city block to erect a building, work expected to start soon.

NEW ENGLAND

A large volume of work tentatively is planned by utilities. The New England Power Co. and Boston Edison Co. have prepared construction budgets for expenditure of $30,000,000 to $35,000,000 in 1938 and 1939, but factors involving financing and business activity will have influence on actual work. The Edison organization will go ahead with some work, notably improvements at the Weymouth, Mass., plant, and will continue its large program at South Boston, where a large power plant is under construction.

The Narragansett Electric Co., covering a large part of Rhode Island, will also proceed with expansion which was started last year.

Plans are under way to enlarge the Summerville, Mass., assembly plant of Ford, contracts to be awarded.

CINCINNATI

American Rolling Mill Co. has announced three improvements. Work has been started on four buildings, at estimated cost of $620,000, exclusive of equipment, in connection with expansion of the cold reduction mill at Middletown. At the Hamilton Coke & Iron Co. division, 15 more coke ovens are being installed, at estimated cost of $500,000. Various improvements at the Ashland, Ky., plant will cost about $175,000.

Procter & Gamble Co., recently awarded contract for a research building to cost about $1,000,000.

ST. LOUIS

Breweries and other beverage companies plan expansion and improvement programs totaling approximately $1,000,000. Small metalworking companies and commercial concerns have scheduled miscellaneous building and re-equipment programs aggregating several hundred thousands of dollars.

Ford Motor Co. has purchased 374 acres near St. Louis for a new assembly plant.

SEATTLE

Oregon utilities have budgeted more than $8,000,000 for improvement and construction work in 1938. Electric and telephone companies will spend nearly $4,000,000 each while gas, water and steam companies will expend lesser amounts.

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CLEVELAND, OHIO
Fay M. Thomas, *Manager*

Activities of Steel Users, Makers

(*Continued from Page 34*)

will act as distributor for Utica air conditioners in the Cincinnati territory. The Utica corporation has also named Buckley & Scott Utilities Inc., Boston, and Buckley & Scott Inc., Providence, R. I., distributors in New England.

•

Standard Brake Shoe & Foundry Co., with offices and plants in Memphis, Tenn., and Pine Bluff, Ark., has appointed Modern Supply Co., Chicago, its sales representative in the latter territory.

•

H. G. Irwin Lumber Co., Erie, Pa., has installed precision woodworking machines in its new factory which can be set to an accuracy of less than 0.001-inch. With this

and a large stock of dry hammerboard maple, the company is prepared to supply the drop forge trade with boards to any specifications.

♦

Hammond Machinery Builders Inc., Kalamazoo, Mich., has removed its eastern branch to larger quarters at 71 West Twenty-third street, New York. W. J. Holtmeier is eastern manager.

♦

George Scherr Co., New York, which has specialized in industrial precision instruments for many years, has taken over the exclusive sale of Leitz optical measuring precision instruments which include various sizes and styles of toolmakers microscopes, large and small projection apparatus, microscopes for surface inspection and also some types for metallurgical purposes.

♦

Scully-Jones & Co., 1901 South Rockwell street, Chicago, in addition to its standard line of tools, is now building special tools which give complete setups for standard or special production operations such as drilling, reaming, counterboring, core drilling and spotfacing. The company's standard tool list has been increased to include boring bars, stellite tipped core drills and reamers, milling machine arbors and a complete line of removable, stellite wear strip, driving bars. Several changes have been made in the company's personnel, as follows: W. Skiba, in charge of production; C. O. Watkins, sales manager; B. F. Rosenberg, plant superintendent; P. Mitchell, advertising manager.

Second Lucy Stack Razed

■ Carnegie-Illinois Steel Corp. pulled down the second stack of the Lucy furnace, Pittsburgh, Feb. 4. No. 1 stack was dismantled Dec. 3. No. 2 was built in 1877. It was erected by the Lucy Furnace Co. and later acquired and enlarged by Carnegie, Phipps & Co., which merged with Carnegie Steel Co. Its capacity was about 60,000 tons annually.

Equipment

St. Louis — Missouri Pacific railway budget, recently approved by the federal court at St. Louis, includes $137,980 for machine tools and $68,210 for roadway machinery.

Chicago—Machinery and equipment inquiries are maintained better than sales. Business continues at the lowest level in three months and is well below the volume a year ago, particularly in small tools. Poor activity in the latter is a direct reflection of low industrial operations. Occasional small inquiries are coming from railroads, but no large lists are involved. Machine tool manufacturers steadily are improving deliveries, though a fair volume of export business tends to offset lag in domestic buying. A number of tool builders will be able to maintain good operations at least through the balance of this quarter.

New York—Slightly more machinery and equipment is up for estimates but early purchase of a good part of such inquiry is not likely. Some industrial firms are preparing lists for possible purchase later. Current orders are few and scattered. Government inquiry and buying has improved. First orders are being placed for machinery to equip a torpedo building plant at Alexandria, Va. Foster Machine Co., Elkhart, Ind., is low on eight turret lathes for the torpedo shops, Newport, R. I.

Seattle — Mining operators are beginning to make inquiries in preparation for the season's opening. Electrical equipment and pumping machinery continue in good demand while city and county inquiry for road maintenance equipment is fairly good. Scrapers and dump trucks are being purchased by several Washington counties.

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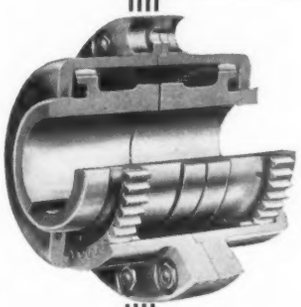

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Construction and Enterprise

Ohio

CLEVELAND—United States Plating Co. has purchased site at 5213-5311 Perkins avenue, Cleveland, and will erect one-story manufacturing building. Cost $45,000.

COLUMBUS, O.—State department of welfare, state house, Columbus, plans motor-driven pumping machinery and accessory equipment and 100,000-gallon elevated steel tank for water system at soldiers and sailors orphan home at Xenia, O. Cost $30,000. J. P. Schooley, state office building, Columbus, state architect.

COLUMBUS, O.—Columbus & Southern Ohio Electric Co. has plans under way for expansion in main steam-electric generating plant, including installing new turbo-generator units and auxiliary equipment, high-pressure boilers and accessory apparatus to increase capacity about 30,000 kilowatts. Cost close to $5,000,000. Work to be carried out this year.

COLUMBUS, O.—Construction of $1,000,000 extension to municipal light plant begins as soon as City Attorney John L. Davies obtains dismissal of injunction suit in federal court obtained by Columbus & Southern Ohio Electric Co. forbidding city to proceed with work. Includes new building east of present plant, new boilers, generating units and other facilities which would permit plant to carry full burden of supplying power for city's new sewage disposal plant and street lighting system.

EUCLID, O.—Linderme Tube Co. will construct one-story plant on property just acquired on E. 219th street, Euclid.

LORAIN, O.—Board of education takes bids soon for 100-kilowatt turbine-generator and auxiliary power house at high school. W. A. Pillam, business manager.

WRIGHT FIELD, DAYTON, O.—War department, air corps, takes bids to 10 a.m., Feb. 11, for 54,000 feet balloon cable, and 54,000 feet extra flexible cable, delivery Middletown, Pa., Osborn, O., Scott Field, Ill., and San Diego, Calif.; until 10:30 a.m., Feb. 17, for hollow-rivet keyway cutters, hollow-rivet setting headers, and hollow-rivet header mandrels, delivery Osborn, O., Middletown, Pa., San Diego, Calif., Duncan Field, Texas.

Pennsylvania

AVIS, PA.—Jersey Shore Steel Co., Avis, recently organized, plans installing heavy-duty motors and controls, regulators, electric hoists, conveyors and other equipment in connection with expansion and improvement program in former local steel mill acquired to be modernized as new plant. Cost $200,000. John A. Shultz, Williamsport, Pa., president.

CALLENSBURG, PA. — Callensburg Roller Mills here recently damaged by fire.

HARRISBURG, PA.—State board of education, Harrisburg, plans power plant for central heating system at State Teachers' college, Edinboro, Pa. Cost $150,000. Richard Irvin, Starr building, Pittsburgh, architect.

HARRISBURG, PA.—General state authority, 600 North Second street, Harrisburg, takes bids to 11 a.m., Feb. 15, for additions to Scranton state hospital at Scranton, Pa. Includes hospital building, power house. Total estimated cost $825,000. John J. Howley, 304 Pauli building, Scranton, architect.

Michigan

CHESANING, MICH.—Fire recently damaged a section of the plant of the Roycroft Coach Co.

DETROIT—Great Lakes Screen & Weatherstrip Co. will erect two-story shop building on Livernois avenue, Detroit.

DETROIT—Board of education plans central heating plant in new three-story high school in northwest part of city. $912,000 authorized.

DETROIT—Buckheit & Stuchell, Detroit, architects, are revising plans for foundry building to be erected at Adrian, Mich., for Bohn Aluminum & Brass Corp., Detroit. New plans ready about Feb. 15.

EWEN, MICH.—Bergland Lumber Co. plans boiler house in connection with rebuilding mill recently damaged by fire.

GRAND RAPIDS, MICH.—Revised preliminary plans completed for constructing factory addition here for Michigan Steel & Bumper Co.

PAW PAW, MICH.—City is considering rebuilding municipal hydro-electric plant recently destroyed by flood waters. Estimated cost $100,000. (Noted in STEEL, Dec. 20, 1937).

UBLY, MICH.—Thumb Electric Cooperative of Michigan, Ubly, has awarded general contract for building to house generating equipment for power plant at Ubly to Henry C. Weber Construction Co., Bay City, Mich.

WYANDOTTE, MICH.—In a special election electors approved constructing county's proposed $400,000 sewage disposal plant. PWA project with federal government and Wayne county sharing cost. (Noted in STEEL, Jan. 17, 1938).

Illinois

CHICAGO—Mudd Machinery Corp. has been incorporated here with 100 shares no par value stock to deal in all types of automatic machines at 450 West Eightieth street. J. W. Moustakas, C. Moustakas, H. Castellaneta, incorporators.

CHICAGO—Marco Iron & Metal Co., 188 West Randolph street, has been incorporated here with 400 shares no par value stock to trade in metal and metal products. G. Marco, J. Marco, and P. Hirschfield, incorporators. Correspondent, Paul J. Hirschfield, 188 West Randolph street.

Indiana

KENDALLVILLE, IND.—City is considering extensions and improvements to municipal power plant, including installing new 1500-kilowatt turbo-generator unit and auxiliary equipment. Estimates of cost being made. S. R. Ludlow, superintendent, municipal light and water plant, is in charge.

NEW ALBANY, IND.—Gohman Foundry Co. plant was damaged during a recent gale.

RICHMOND, IND. — Knowles Tool Corp., 800 South Seventh street, Richmond, has filed articles of incorporation. Will manufacture tools, dies, jigs, special machinery. Jessie L. Knowles, Virginia Bradley, and J. R. Harrington, incorporators.

TIPTON, IND.—Fire damaged the Stokely Bros. Co. canning factory here.

New York

NEW YORK—Hobart Welding Accessories Inc. has been incorporated here with 50 shares no par value stock to mold metals with electricity.

NEW YORK—G. Berggren Machine Co. has been incorporated here to deal in tools and machinery, with 100 shares no par value stock.

NEW YORK—Coast-To-Coast Steel & Equipment Corp., 101 West Thirty-first street, New York, would like to purchase 300-foot Alvey conveyor, 14-inch gravity type, and three boosters for conveyors.

NEW YORK—F. W. Woolworth Co., Woolworth building, plans central heating plant and air conditioning system in new three-story and basement store building at Charlotte, N. C. Cost $400,000. R. H. Struelsing, Atlanta, Ga., architect.

WESTFIELD, N. Y.—City plans exten-

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sions in municipal power plant. Cost close to $40,000.

New Jersey

LINDEN, N. J.—General Motors Corp., Linden division, plans installing motors and controls, conveyors and other equipment in new one-story addition to local auto assembly works. Cost $100,000. W. S. Roberts, plant general manager.

LONG BRANCH, N. J.—City plans motor-driven pumping plant in connection with new sewage treatment works. Cost over $75,000. C. J. Kupper, 409 East Main street, Bound Brook, N. J., consulting engineer. (Noted in STEEL, Dec. 27, 1937.)

District of Columbia

WASHINGTON—U. S. engineer office, 1068 Navy building, receives bids to Feb. 10 for furnishing, installing and testing three power distribution transformers and oil circuit breaker switchgear units at Dalecarlia filter plant.

WASHINGTON — General purchasing officer, Panama canal, takes bids to 10:30 a.m., Feb. 11, schedule 3329, for coil chain, lock-link chain, and steel pipe, delivery Cristobal or Balboa, Canal zone; until 10:30 a.m., Feb. 15, schedule 3330, for wire rope, electric motors, panelboards, chain hoists and nails, delivery Cristobal or Balboa, Canal zone.

WASHINGTON — Navy department, bureau of supplies and accounts, takes bids to 10 a.m., Feb. 11, schedule 2696, for universal motor-driven milling machine, delivery San Diego, Calif.; schedule 2697, for motor-driven milling machine, delivery San Diego, Calif.; schedule 2755, for universal motor-driven woodboring machine, delivery Boston; schedule 2757, for two motor-driven tool grinders, delivery Brooklyn, N. Y.; until 10 a.m., Feb. 15, schedule 2726, for steel bolts, nuts, and lag screws, delivery various east and west coast points; schedule 2728, for aircraft propellors, delivery various east and west coast points; schedule 2735, for tool-room type precision lathe, delivery, Keyport, Wash.; schedule 2736, for motor-driven milling machine, delivery Mare Island, Calif.; schedule 2763, for ball and roller bearings, delivery various east and west coast points.

Kentucky

LEXINGTON, KY.—Kentucky Utilities Co. Inc., 159 West Main street, Lexington, N. P. Taylor, transmission and distribution engineer, and associated companies, plans following work during 1938: Old Dominion Power Co., five miles transmission lines, 10 miles rural lines, and 2500-kilovolt-ampere substation; Kentucky Power & Light Co., two-mile transmission line, 10-mile rural line, 2000-kilovolt-ampere substation; Lexington Utilities Co., 20 miles rural lines, 1000-kilovolt-ampere substation capacity; Kentucky Utilities Co., 16 miles transmission lines, 70 miles rural line, 3500-kilovolt-ampere substation capacity.

LEXINGTON, KY.—Lexington Telephone Co. is installing automatic exchange on Walnut Hill farm, and plans installing automatic system in Wilmore and Midway. Burt Ruffner, plant superintendent.

LOUISVILLE, KY.—Premier Paper Co., 809 West Main street, Louisville, plans constructing factory and storage plant to replace one destroyed by fire. Estimated cost including equipment $40,000.

LOUISVILLE, KY.—Plant of DeHart Paint & Varnish Co., 901-03 East Main street was damaged by fire. Phillip Ketterer, 1401 East Washington, superintendent.

LOUISVILLE, KY.—Falls City Brewing Co., Thirty-first street and Broadway, has permit for addition to bottling plant. Cost $75,000. Struck Construction Co., 147 North Clay street, general contractor. Walter C. Wagner, Breslin building, architect.

OWENSBORO, KY.—Elmer Smith, chief engineer, light plant, recommended to city commission expenditure of $27,000 for new equipment and changes at plant.

Florida

COCOA, FLA.—Loring Millwork Co., Ralph N. Loring, Box 706, has site and will erect plant in late summer or early fall.

MIAMI, FLA.—Florida National Building Corp., Miami, plans new electric generating station to furnish light and power for new 16-story bank building now being erected at E. Flagler street and Second avenue, using diesel generating units and accessory equipment. Work begins soon. Cost with equipment $250,000.

NEPTUNE BEACH, FLA.—Town, J. L. Burke, town engineer, plans $91,274 improvements to waterworks. Includes installing 10,000 feet of 2-inch, 12,560 feet of 3-inch, 4100 feet of 6-inch, 3550 feet of 8-inch cast-iron pipe; 100,000-gallon steel water tank, 110-foot tower; two 750-gallon electrically-driven pumps, 750-gallon diesel engine-driven centrifugal pumps. (Noted in STEEL, Jan. 24, 1938).

PALATKA, FLA.—J. T. Hedrick and H. K. Ross acquired mill of Boaz Mfg. Co. Will modernize plant and erect new building to manufacture boxes, crates and barrels, later add a hamper unit.

Georgia

AMERICUS, GA.—J. K. Luck, Sumter county agent, soon begins work on 73-mile electric line in Sumter county. D. L. Thomas, project manager. Current will be furnished by Georgia Power Co.

DOUGLAS, GA.—Rosa Co., W. Q. Walker, manager, is rebuilding burned turpentine still to double former capacity.

Mississippi

FERNWOOD, MISS.—Gulf Wood Preserving Co., Fernwood, contemplates constructing wood preserving plant. Estimated cost $100,000.

Missouri

KANSAS CITY, MO.—Kansas City Power & Light Co. has plans under way for extensions and improvements in main steam-electric generating plant, including installing new turbo-generator unit with 25,000-kilowatt capacity, high-pressure boilers, and auxiliary equipment. Cost of entire project $3,000,000.

TRENTON, MO.—City is constructing power plant. Ebbe Construction Co., Trenton, general contractor. Burns & McDonnell Engineering Co., 107 West Linwood boulevard, Kansas City, Mo.

Arkansas

GURDON, ARK.—Cox brothers plan establishing cotton oil mill located near city limits. Board of trade interested in project.

PINE BLUFF, ARK.—Arkansas Power & Light Co., Pine Bluff, petitioned state utilities commission, Little Rock, for permission to construct 38½ miles rural lines in western Pulaski county, also 47 miles rural lines in Pope and Faulkner counties. Total cost $64,834.

Oklahoma

MIAMI, OKLA.—City commission authorized purchase by city utilities board of diesel engine for light and water department.

OKLAHOMA CITY, OKLA.—S. M. Stauffer, 1226 Northwest Nineteenth street, is interested in organizing company to build and operate steel pipe line natural gas distribution system in several cities in northern part of the state. Cost $100,000.

OKLAHOMA CITY, OKLA.—Oklahoma Gas & Electric Co., 321 North Harvey street, Oklahoma City, and Louisville Gas & Electric Co., 311 West Chestnut street, Louisville, Ky., operating subsidiaries of Standard Gas & Electric Co.,

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111 Broadway, N. Y., will spend following amounts during 1938: Louisville Gas & Electric Co. will spend $1,150,240 on new projects out of $2,447,767 total included in tentative budget; work includes several electric transmission lines in Jefferson county, new substation to serve Crescent Hill and the Highlands, remainder of budget for completion of work under way; Oklahoma Gas & Electric Co. will spend $2,861,257.

Wisconsin

GLENWOOD CITY, WIS.—St. Croix County Electric Co-operative Inc., Glenwood City, William Rutzen, president, has plans under way for primary and secondary lines for rural electric systems in parts of St. Croix and neighboring counties totaling 270 miles, with outdoor power substations and service facilities. Cost $270,000. Financing through federal aid. E. B. Wayts, Tenney building, Madison, Wis., chief engineer, Wisconsin rural electrification administration, is in charge.

RICHLAND CENTER, WIS.—City will call for bids Feb. 15 for one 2500-kilowatt turbine and other improvements to municipal light plant. Cost $110,000. G. C. Luckey, city clerk.

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Minnesota

GLENWOOD, MINN. — City, J. H. Thoreson, city clerk, will hold an election late in February on $200,000 bond issue to aid financing constructing new municipal light plant, including generating equipment and electric distribution system. $67,909 has been made available by PWA. F. P. Schaub, city engineer. Burlingame, Hitchcock & Estabrook, 521 Sexton building, Minneapolis, consulting engineers.

JORDAN, MINN.—Minnesota Valley Electric Co-operative, O. W. Mueller, secretary, takes bids to Feb. 17, 2 p.m., for constructing 105 miles rural transmission lines in Scott, Carver Sibley, LeSueur and McLeod counties. Estimated cost $100,000. Banister Engineering Co., 1586 University avenue, St. Paul, consulting engineer.

LITCHFIELD, MINN.—City, William V. Martinson, city clerk, may hold special election soon to vote on bond issue to finance constructing sewage disposal plant. Cost $60,000. Foster & Wahlberg, 316 Medical Arts building, Duluth, consulting engineers.

WESTBROOK, MINN.—Village, T. V. Peterson, clerk, will vote Feb. 8 on bond issue to finance constructing light and power plant. Cost about $78,200. Buell & Winter Engineering Co., 508 Insurance Exchange building, Sioux City, Iowa, consulting engineer, (Noted in STEEL, Aug. 8, 1937)

Texas

AUSTIN, TEX.—Lower Colorado river authority, room 819, Littlefield building, receives bids Feb. 15 for constructing 29 miles of 138-kilovolt transmission line from Marble Falls to Marshall ford. Steel towers, poles, and other equipment will be furnished by the authority.

COLEMAN, TEX.—Coleman County Rural Electrification Co-operative, A. W. Luckett, has $100,000 allotment from REA for constructing rural power lines. William G. Morrison, Professional building, Waco, engineer.

HOUSTON, TEX.—City water department, J. Perry Moore, director, calls for bids soon for $800,000 emergency improvement program. Includes drilling three wells at approximate cost of $70,000, and $47,650 worth of cast-iron pipes, valves, fittings, and fire hydrants.

LIBERTY, TEX.—City, Tom Calhoun, mayor, receives bids soon for power plant. Has loan and grant totaling $95,000. Work includes power plant building, three 150-kilowatt generators, power plant switchboard, and wiring to serve 400 dwellings and business buildings. Garrett Engineering Co., Box 1726, Houston, engineer. (Noted in STEEL, Dec. 13, 1937).

MADISONVILLE, TEX.—City voted issuance of $40,000 bonds to build municipal butane gas plant.

Kansas

WICHITA, KANS.—Forrest Hills Cos., care of E. House, 120 S street, is preparing plans for constructing sewage disposal plant. Cost $38,000. F. E. Devlin, W-K-H building, consulting engineer.

Iowa

CEDAR FALLS, IOWA—City is preparing plans for constructing sewage disposal plant. Cost about $100,000. C. N. Streeter, city engineer.

DES MOINES, IOWA—Des Moines Ice & Fuel Co., 100 Maple street, plans extensions in pumping station at 800 New York avenue, to include 150,000-gallon steel storage tank and other equipment. Cost $30,000.

MUSCATINE, IOWA—Board of education plans central heating plant in new three-story high school. Will ask for bids on general contract at early date. Cost about $500,000. Keffer & Jones, Masonic Temple building, Des Moines, architects.

ODEBOLT, IOWA—WPA has alloted $3770 to city for constructing improvements at sewage disposal plant. A. J. Schmitz, city clerk.

WAVERLY, IOWA—Bremer county agent, courthouse, Waverly, is seeking REA funds to finance constructing 122 miles rural transmission lines in the county.

WEBSTER CITY, IOWA—City, Dorothy Neel, city clerk, is considering means of financing constructing sewage disposal plant and intercepting sewer. Cost $150,000. Currie Engineering Co., Webster City, consulting engineer.

Nebraska

LINCOLN, NEBR.—Eastern Nebraska Public Power District, George W. Kline, secretary, 522 First National Bank building, has been given permission by state railway commission to construct 84 miles rural transmission lines in Johnson, Otoe and Pawnee counties. Cost $85,000. H. H. Henningsen Engineering Co., 326 Union State Bank building, Omaha, consulting engineer.

Colorado

BRIGGSDALE, COLO.—City plans rebuilding part of municipal power plant, recently damaged by fire.

Montana

SIDNEY, MONT.—State water conservation board, Capitol building, Helena, E. B. Donohue, chief engineer, plans power substation with three main transformers, switchgear and accessory equipment and 12 miles transmission lines in connection with reclamation project in Richland county. Also will install five main motor-driven pumping units, two 4500-gallon-per-minute capacity, two 6750 gallon-per-minute capacity, one 7200-gallon-per-minute capacity. Cost of project $100,000. Bids will be called soon.

Pacific Coast

ALTURAS, CALIF.—Surprise Valley Electric Corp. will soon award contracts for steam-electric generating station near Alturas. Cost $100,000. T. Ruegg, 251 Kearney street, San Francisco, architect.

OLYMPIA, WASH.—Interlaken Canning Co., route 3, has been incorporated here with capital stock of $25,000. G. H. Tranum and associates, incorporators.

SEATTLE—Lockhart Metal Bonding Co. has leased plant at 1725 Jackson street to develop new process for relining cylinders and reconditioning shafts and rollers.

YAKIMA, WASH.—John W. Maloney, local architect, is preparing plans for proposed hospital for Sisters House of Providence at Anchorage, Alaska. Bids will be invited in six weeks. Includes complete heating, power, refrigerating and mechanical plants. Cost $275,000.